

Installer manual

AXC 50

Accessories

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1 General

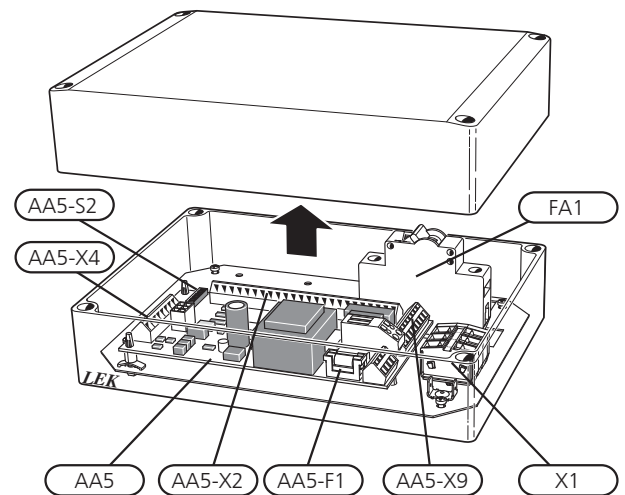
This accessory is used to enable connection and control of (a AXC 50 is required for each of the following accessory functions that is used):

- Shunt controlled additional heat
- Step controlled additional heat
- Passive cooling (4-pipe)
- Passive cooling (2-pipe)
- Passive/active cooling (2-pipe)
- Extra climate system
- Hot water comfort
- Groundwater pump

Contents

4 x	Cable ties
2 x	Heating pipe paste
1 x	Insulation tape
1 x	Unit box with accessory card
2 x	Aluminium tape
2 x	Temperature sensor

Component positions



Electrical components

FA1	Miniature circuit-breaker. 10A
X1	Terminal block, power supply
AA5	Accessory card
AA5-X2	Terminal block, sensors and external blocking
AA5-X4	Terminal block, communication
AA5-X9	Terminal block, circulation pump, mixing valve and auxiliary relay
AA5-S2	DIP switch
AA5-F1	Fine wire fuse, T4AH250V

Designations in component locations according to standard IEC 81346-1 and 81346-2.

2 Common electrical connection



NOTE

All electrical connections must be carried out by an authorised electrician.

Electrical installation and wiring must be carried out in accordance with the stipulations in force.

The heat pump must not be powered when installing AXC 50.

Electrical circuit diagrams are at the end of the chapter for each connection option.

Connecting communication

This accessory contains an accessory card (AA5) that must be connected directly to the heat pump on terminal block X6 in F1345.

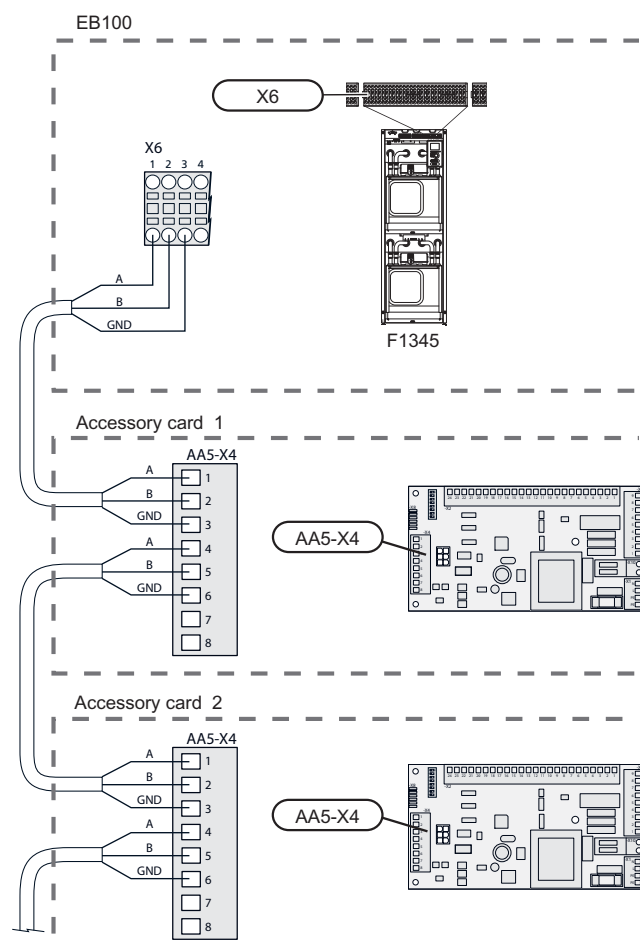
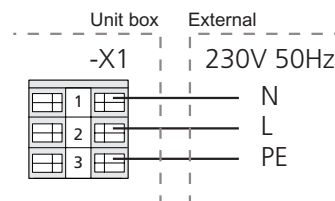
If several accessories are to be connected or are already installed, the following instructions must be followed.

The first accessory card must be connected directly to the terminal block X6 in F1345. The following cards must be connected in series with the previous card.

Use cable type LiYY, EKKX or similar.

Connecting the supply

Connect the power supply to terminal block X1 as illustrated.



3 Shunt controlled additional heat

General

This connection enables an external additional heater, e.g. an oil boiler, gas boiler or district heating exchanger to aid with heating.

The heat pump controls a shunt valve and a circulation pump via AXC 50. If the heat pump cannot maintain the right flow temperature the additional heating starts. When the boiler temperature has been increased to about 55 °C, the heat pump sends a signal to the shunt (QN11) to open from the addition. The shunt (QN11) adjusts so the true flow temperature corresponds with the control system's theoretical calculated set point value. When the heating requirement drops sufficiently so the additional heat is no longer required the shunt (QN11) closes completely. Factory set minimum connection time for the boiler is 12 hours (adjustable in menu 5.3.2).

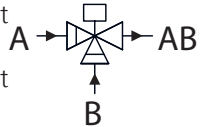
Pipe connections

The external circulation pump (GP10) is positioned according to the outline diagram.

Shunt valve

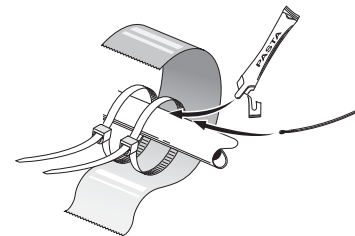
The shunt valve (QN11) is located on the flow line to the climate system after the heat pump according to the outline diagram.

- Connect the flow line from the heat pump to the external heat source via the T-pipe to port B on the shunt valve (closes at reduced signal).
- Connect the flow line to the climate system from the shunt valve to the common port AB (always open)
- Connect the flow line from the external additional heat to the shunt valve to port A (opens at increased signal).



Temperature sensor

- Install the boiler sensor (BT52) in a suitable location in the external addition.
- External flow temperature sensor (BT25, connected in F1345) must be installed on the flow line to the radiators, after the shunt valve (QN11).



Install the temperature sensors with cable ties with the heat conducting paste and aluminium tape. Then insulate with supplied insulation tape.



NOTE

Sensor and communication cables must not be placed near power cables.

Outline diagram

Explanation

EB100 Heat pump system (Master)

BT1	Temperature sensor, outdoor
BT6	Temperature sensor, hot water charging
BT25	Temperature sensor, heating medium flow, External
BT71	Temperature sensor, heating medium return, External
EB100	Heat pump, F1345
EP14	Cooling module A
EP15	Cooling module B
FL11 - FL12	Safety valve, collector side
FL13 - FL14	Safety valve, heating medium side
HQ12 - HQ15	Particle filter
QM50 - QM53	Shut-off valve, brine side
QM54 - QM57	Shut-off valve, heating medium side
QN10	Reversing valve, heating/hot water
RM10 - RM13	Non-return valve

EM1 External additional heat

AA5	Accessory card (AXC 50)
BT52	Temperature sensor, boiler
CM5	Expansion vessel, closed

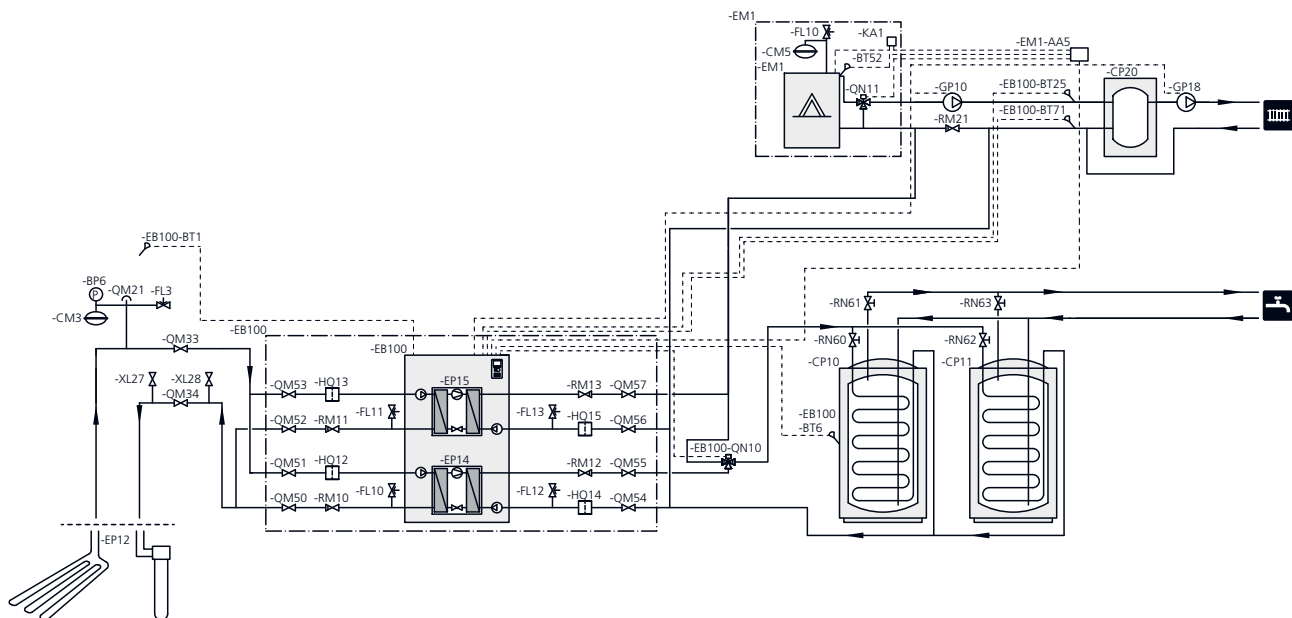
EM1	Oil/gas boiler
FL10	Safety valve, heating medium side
KA1	Auxiliary relay, external additional heat
QN11	Mixing valve, addition

Miscellaneous

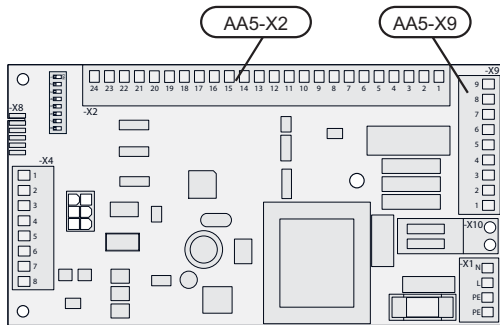
BP6	Manometer, brine side
BT70	Temperature sensor, hot water flow
CP10, CP11	Accumulator tank with hot water coil
CP20	Buffer vessel, UKV
CM3	Expansion vessel, closed, brine side
EP12	Collector, brine side
FL3	Safety valve, brine
GP10	Circulation pump, heating medium external
GP18	Circulation pump, heating medium external
QM21	Venting valve, brine side
QM33	Shut off valve, brine flow
QM34	Shut off valve, brine return
RM21	Non-return valve
RN60 - RN63	Trim valve
XL27 - XL28	Connection, filling brine

Designations according to standards 81346-1 and 81346-2.

Outline diagram F1345 with AXC 50 and external addition



Electrical connection



NOTE

All electrical connections must be carried out by an authorised electrician.

Electrical installation and wiring must be carried out in accordance with the stipulations in force.

F1345 must not be powered when installing AXC 50.

Connection of sensors and external blocking

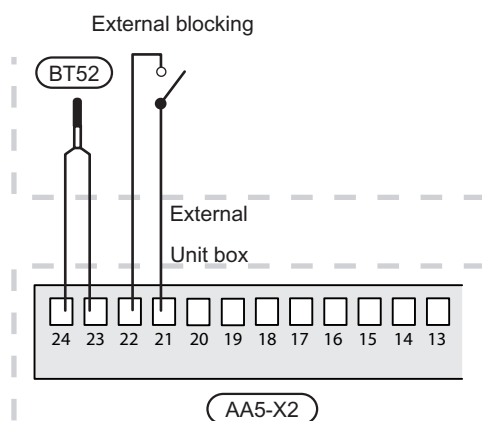
Use cable type LiYY, EKKX or similar.

Boiler sensor (BT52)

Connect the boiler sensor to AA5-X2:23-24.

External blocking (optional)

A contact (NO) can be connected to AA5-X2:21-22 to block the addition. When the contact closes, the addition is blocked.

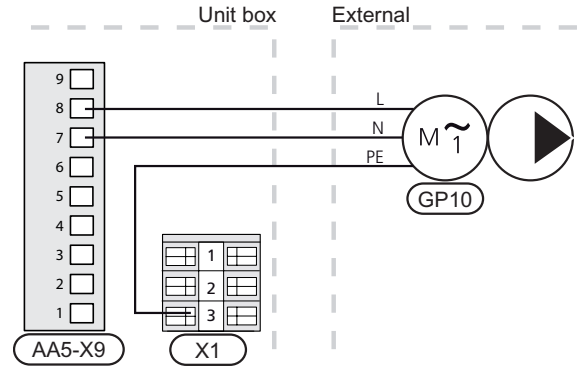


Caution

The relay outputs on the accessory card can have a max load of 2 A (230 V) in total.

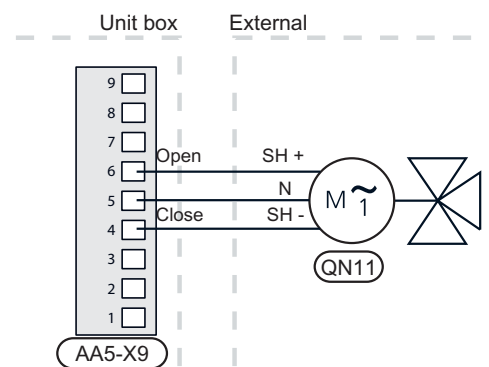
Connection of the circulation pump (GP10)

Connect the circulation pump (GP10) to AA5-X9:8 (230 V), AA5-X9:7 (N) and X1:3 (PE).



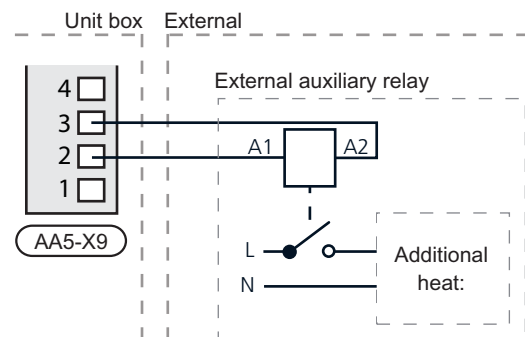
Connection of the mixing valve motor (QN11)

Connect the mixing valve motor (QN11) to AA5-X9:6 (230 V, open), AA5-X9:5 (N) and AA5-X9:4 (230 V, close).



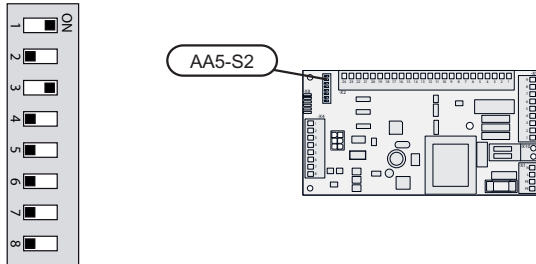
Connection of the auxiliary relay for additional heating

Connect the auxiliary relay for switching the addition on and off to AA5-X9:2 (230 V) and AA5-X9:3 (N).



DIP switch

The DIP switch on the accessory card must be set as follows.



Program settings

Program setting of AXC 50 can be performed via the start guide or directly in the menu system.

Start guide

The start guide appears upon first start-up after heat pump installation, but is also found in menu 5.7.

Menu system

If you do not make all settings via the start guide or need to change any of the settings, this can be done in the menu system.

Menu 5.2.4 - accessories

Activating/deactivating of accessories.

Select: "shunt controlled add. heat".

Menu 5.3.2 - shunt controlled add. heat

Here you can perform the following settings:

- Select when the addition is to start.
- Minimum running time.
- Minimum boiler temperature at which the shunt can start control.
- Misc. shunt settings.

Menu 5.6 - forced control

Forced control of the different components in the heat pump as well as in the different accessories that may be connected.

EM1-AA5-K1: Activating the relay for extra heating.

EM1-AA5-K2: Signal (close) to mixing valve (QN11).

EM1-AA5-K3: Signal (open) to mixing valve (QN11).

EM1-AA5-K4: Activating the circulation pump (GP10).



Caution

Also see the Operating manual for F1345.

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4 Step controlled additional heat

General

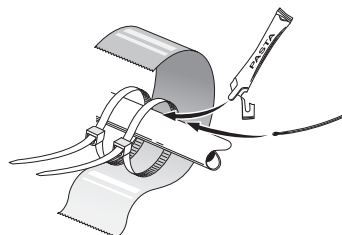
With AXC 50 a further three potential free relays are used for addition control, which then gives max 3+3 linear or 7+7 binary steps.

Pipe connections

The extra circulation pump (GP10) is positioned according to the outline diagram.

Temperature sensor

- External flow temperature sensor (BT25, connected in F1345) must be installed on the flow line to the radiators, after the additional heat.



Install the temperature sensors with cable ties with the heat conducting paste and aluminium tape. Then insulate with supplied insulation tape.



NOTE

Sensor and communication cables must not be placed near power cables.

Outline diagram

Explanation

EB1 External additional heat

AA5	Accessory card (AXC 50)
CM5	Expansion vessel, closed
EB1	External electrical additional heat
FL10	Safety valve, heating medium side
QM42 - QM43	Shut-off valve, heating medium side
RN11	Trim valve

EB100 Heat pump system (Master)

BT1	Temperature sensor, outdoor
BT6	Temperature sensor, hot water charging
BT25	Temperature sensor, heating medium flow, External
BT71	Temperature sensor, heating medium return, External
EB100	Heat pump, F1345
EP14	Cooling module A
EP15	Cooling module B
FL11 - FL12	Safety valve, collector side
FL13 - FL14	Safety valve, heating medium side
HQ12 - HQ15	Particle filter

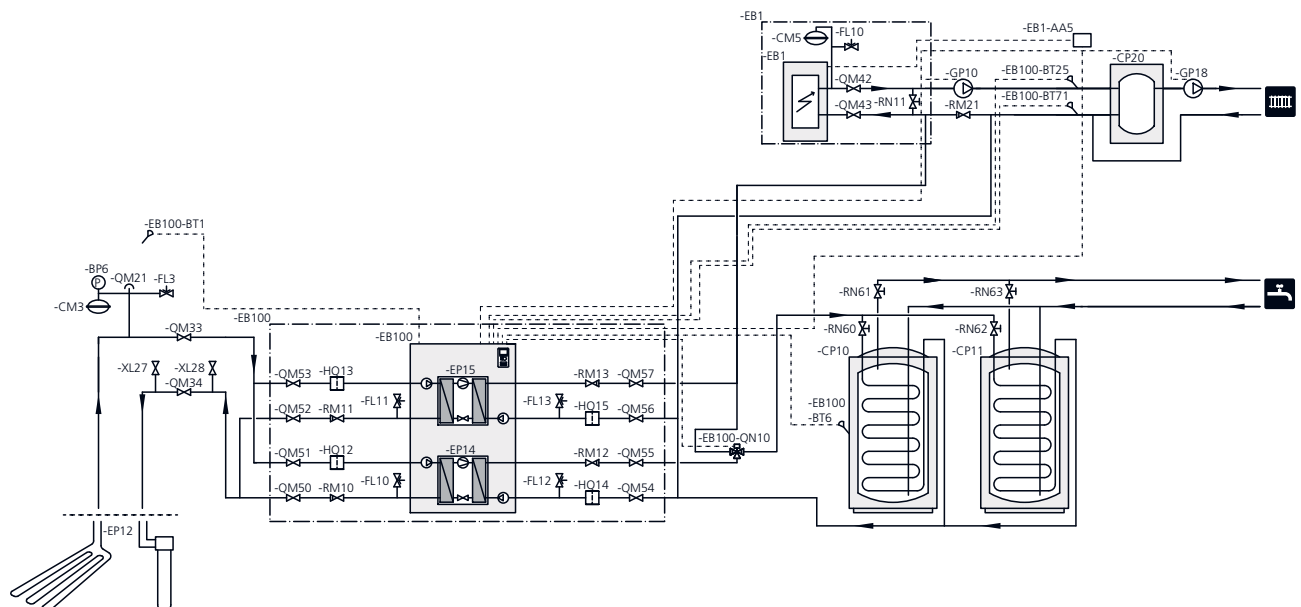
QM50 - QM53	Shut-off valve, brine side
QM54 - QM57	Shut-off valve, heating medium side
QN10	Reversing valve, heating/hot water
RM10 - RM13	Non-return valve

Miscellaneous

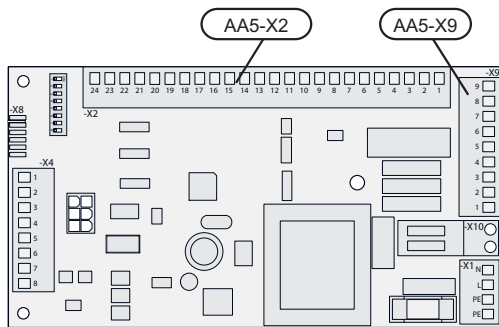
BP6	Manometer, brine side
CP10, CP11	Accumulator tank with hot water coil
CP20	Buffer vessel, UKV
CM3	Expansion vessel, closed, brine side
EP12	Collector, brine side
FL3	Safety valve, brine
GP10	Circulation pump, heating medium external
GP18	Circulation pump, heating medium external
QM21	Venting valve, brine side
QM33	Shut off valve, brine flow
QM34	Shut off valve, brine return
RM21, RM42	- Non-return valve
RM43	
RN60 - RN63	Trim valve
XL27 - XL28	Connection, filling brine

Designations according to standards 81346-1 and 81346-2.

Outline diagram F1345 with AXC 50 and external addition



Electrical connection



NOTE

All electrical connections must be carried out by an authorised electrician.

Electrical installation and wiring must be carried out in accordance with the stipulations in force.

F1345 must not be powered when installing AXC 50.

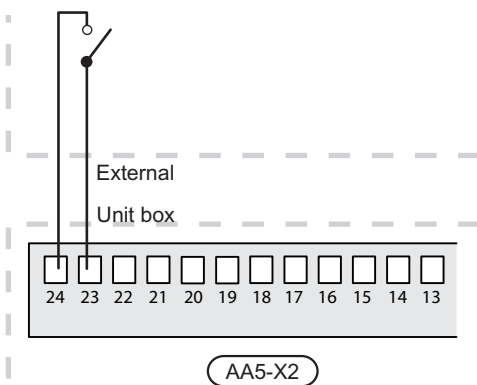
Connecting external blocking

Use cable type LiYY, EKKX or similar.

External blocking (optional)

A contact (NO) can be connected to AA5-X2:23-24 to block the addition. When the contact closes, the addition is blocked.

External blocking

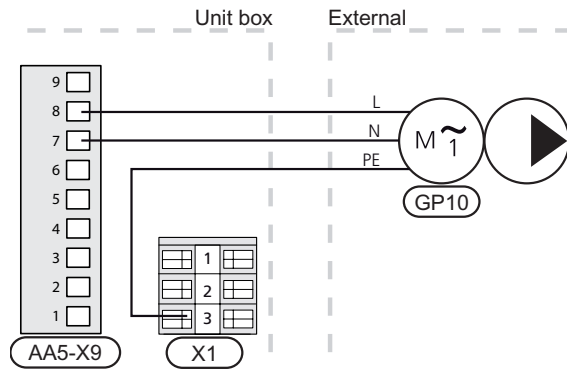


Caution

The relay outputs on the accessory card can have a max load of 2 A (230 V) in total.

Connection of the circulation pump (GP10)

Connect the circulation pump (GP10) to AA5-X9:8 (230 V), AA5-X9:7 (N) and X1:3 (PE).

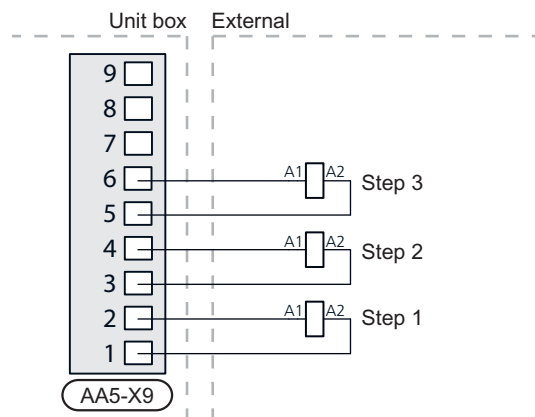


Connecting additional step

Connect step 1 to AA5-X9:1 and 2.

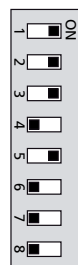
Connect step 2 to AA5-X9:3 and 4.

Connect step 3 to AA5-X9:5 and 6.

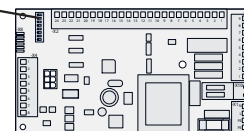


DIP switch

The DIP switch on the accessory card must be set as follows.



AA5-S2



Program settings

Program setting of AXC 50 can be performed via the start guide or directly in the menu system.

Start guide

The start guide appears upon first start-up after heat pump installation, but is also found in menu 5.7.

Menu system

If you do not make all settings via the start guide or need to change any of the settings, this can be done in the menu system.

Menu 5.2.4 - accessories

Activating/deactivating of accessories.

Select: "step controlled add. heat AXC 50".

Menu 5.3.6 - step controlled add. heat AXC 50

Here you can perform the following settings:

- Select when the addition is to start.
- Set max permitted number of additional steps.
- If binary stepping is to be used.



Caution

"start diff additional heat" in the menus 5.3.6 (connected to AXC 50) and 4.9.3 (connected internally in F1345) are factory set to 400GM. If both the connection possibilities are used and one wishes to have more steps the start difference must be changed in one of the menus.

Menu 5.6 - forced control

Forced control of the different components in the heat pump as well as in the different accessories that may be connected.

EB1-AA5-K1: Activating additional step 1.

EB1-AA5-K2: Activating additional step 2.

EB1-AA5-K3: Activating additional step 3.

EB1-AA5-K4: Activating the circulation pump (GP10).



Caution

Also see the Operating manual for F1345.

[illegible]

5 Extra climate system

General

This accessory is used when F1345 is installed in houses with up to four different climate systems that require different flow line temperatures, for example, in cases where the house has both a radiator system and an under floor heating system.



Caution

Underfloor heating systems are normally **max flow line temperature** set between 35 and 45 °C.

Check the max temperature for your floor with your floor supplier.



Caution

If the room sensor is used in a room with under floor heating it should only have an indicative function, not control of the room temperature.

Pipe connections

General

When connecting extra climate systems, they must be connected so that they have a lower working temperature than the climate system 1.

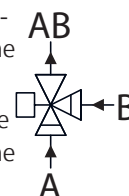
Circulation pump

The extra circulation pump (GP20) is positioned in the extra climate system according to the outline diagram.

Shunt valve

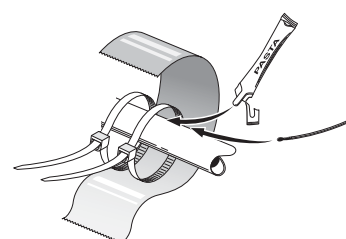
The mixing valve (QN25) is located on the flow line after the heat pump/indoor module, before the first radiator in the climate system 1. The return line from the additional climate system must be connected to the shunt valve and to the return line from the heating system 1, see image and outline diagram.

- Connect the flow line to the climate system from the heat pump to port A on the shunt valve (opens at increased signal)
- Connect the return line from the climate system to port B on the shunt valve via the T-pipe to (closes at reduced signal).
- Connect the flow line to the climate system to the common port AB on the shunt valve (always open).



Temperature sensor

- The flow temperature sensor (BT2) is installed on the pipe between the circulation pump (GP20) and mixing valve (QN25).
- The return line sensor (BT3) is installed on the pipe from the extra climate system.



Install the temperature sensors with cable ties with the heat conducting paste and aluminium tape. Then insulate with supplied insulation tape.



NOTE

Sensor and communication cables must not be placed near power cables.

Outline diagram

Explanation

EB1 External additional heat

CM5 Expansion vessel, closed
 EB1 External electrical additional heat
 FL10 Safety valve, heating medium side
 QM42 - Shut-off valve, heating medium side
 QM43
 RN11 Trim valve

EB15 Indoor module

EB15 Indoor module

EB100 Heat pump system

BT1 Temperature sensor, outdoor
 BT6 Temperature sensor, hot water
 BT25 Temperature sensor, external flow line
 BT71 Temperature sensor, external return line
 EB100 Heat pump, F1345
 EP14 Cooling module A
 EP15 Cooling module B
 FL10 - Safety valve, collector side
 FL11
 FL12 - Safety valve, heating medium side
 FL13
 HQ1 Particle filter
 HQ12 -
 HQ15
 QM50 - Shut-off valve, brine side
 QM53
 QM54 - Shut-off valve, heating medium side
 QM57
 QN10 Reversing valve, heating/hot water
 RM10 - Non-return valve
 RM13

EP21 Climate system 2

AA5 Accessory card (AXC 50)

BT2 Flow temperature sensor, extra climate system
 BT3 Return line sensor, extra climate system
 GP20 Circulation pump, extra climate system
 QN25 Shunt valve

EP22 Climate system 3

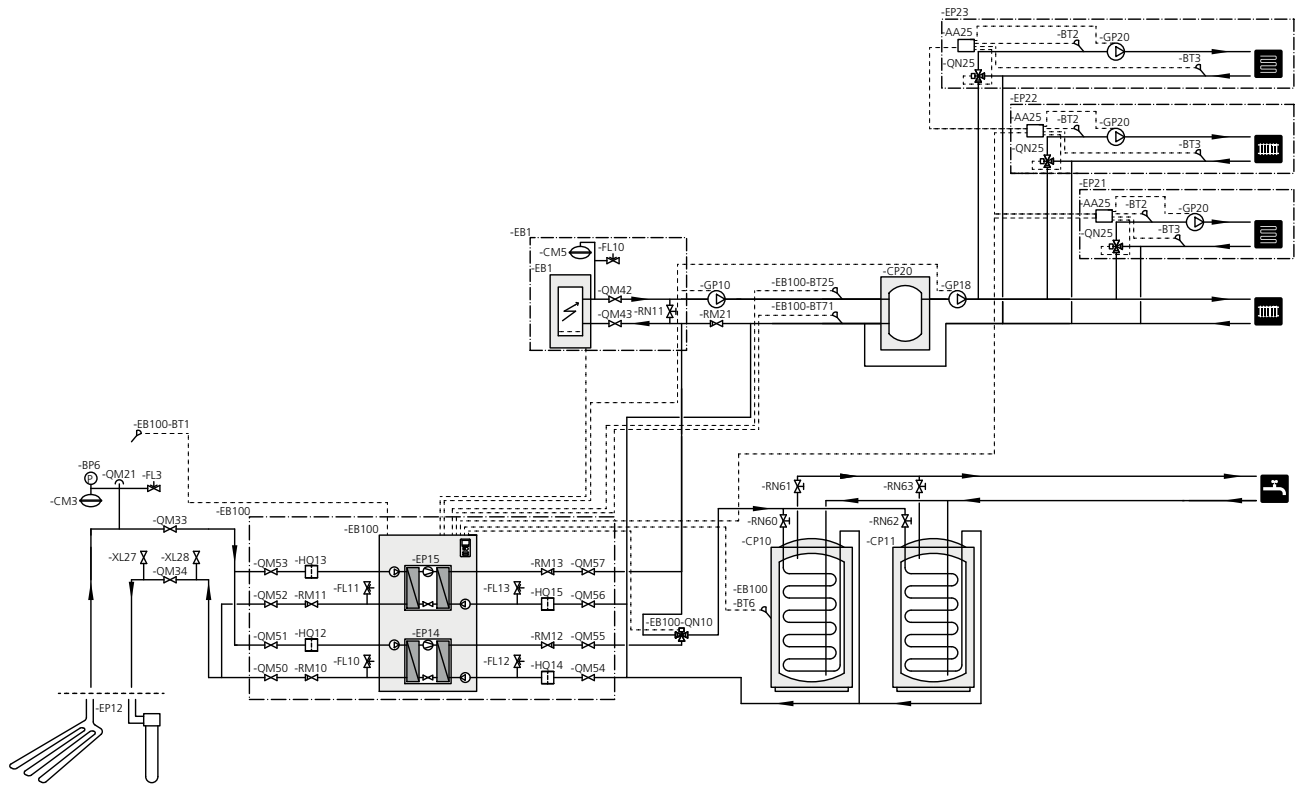
EP23 Climate system 4

Miscellaneous

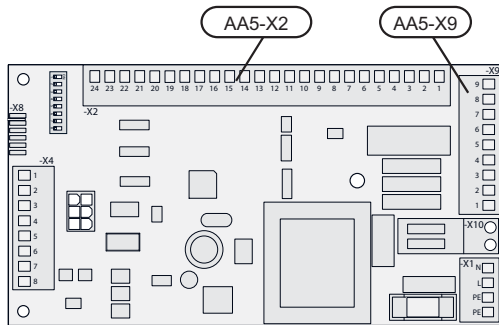
BP6 Manometer, brine side
 CM1 Expansion vessel, heating medium side
 CM2 Level vessel
 CM3 Expansion vessel, brine side
 CP10, Accumulator tank with solar coil
 CP11
 CP20 Buffer vessel
 EP12 Ground-source heating/Ground collector
 FL2 Safety valve, heating medium
 FL3 Safety valve, brine
 GP10, Circulation pump, heating medium external
 GP18
 QM12 Filler valve, brine
 QM21 Venting valve, brine side
 QM31 Shut-off valve, heating medium flow
 QM32 Shut off valve, heating medium return
 QM33 Shut off valve, brine return
 QM34 Shut off valve, brine flow
 QM42 Shut-off valve
 RM2, Non-return valve
 RM21
 RN60 - Trim valves
 RN63
 XL15 Filling set, brine
 XL27 - Connection, filling brine
 XL28

Designations in component locations according to standard IEC 81346-1 and 81346-2.

Outline diagram F1345 with AXC 50 and up to three extra climate systems



Electrical connection



NOTE

All electrical connections must be carried out by an authorised electrician.

Electrical installation and wiring must be carried out in accordance with the stipulations in force.

F1345 must not be powered when installing AXC 50.

Connection of sensors and external adjustment

Use cable type LiYY, EKKX or similar.

Flow temperature sensor, extra climate system (BT2)

Connect the flow temperature sensor to AA5-X2:23-24.

Return line sensor, extra climate system (BT3)

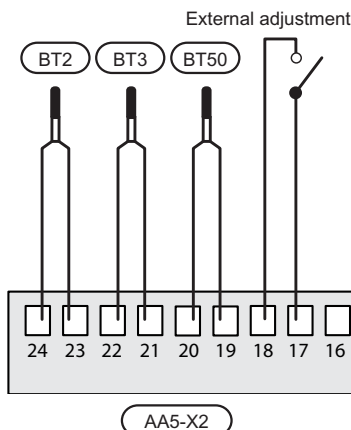
Connect the return line sensor to AA5-X2:21-22.

Room temperature sensor, extra climate system (BT50) (optional)

Connect the room temperature sensor to AA5-X2:19-20.

External adjustment (optional)

A potential free switch can be connected to AA5-X2:17-18 for external adjustment of the climate system.

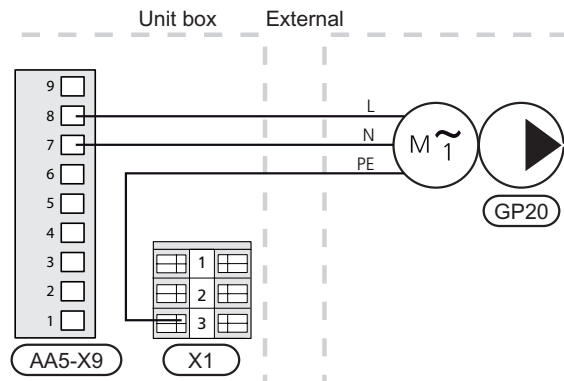


Caution

The relay outputs on the accessory card can have a max load of 2 A (230 V) in total.

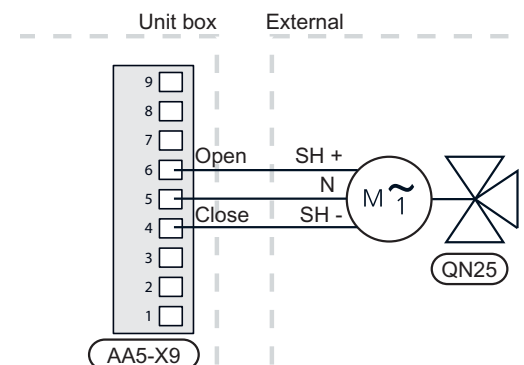
Connection of the circulation pump (GP20)

Connect the circulation pump (GP20) to AA5-X9:8 (230 V), AA5-X9:7 (N) and X1:3 (PE).



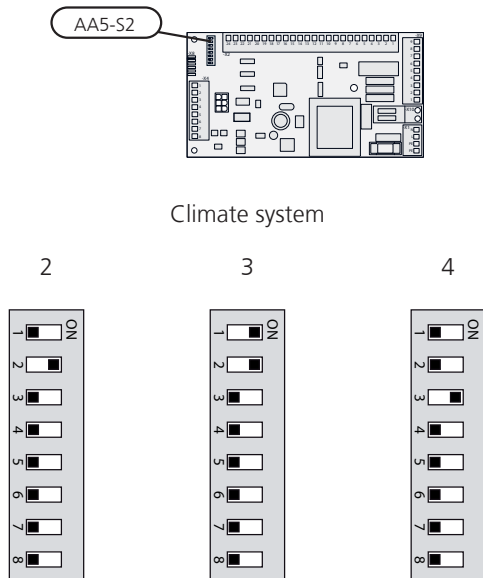
Connection of the mixing valve motor (QN25)

Connect the mixing valve motor (QN25) to AA5-X9:6 (230 V, open), AA5-X9:5 (N) and AA5-X9:4 (230 V, close).



DIP switch

The DIP switch on the accessory card must be set as follows.



Climate system

Program settings

Program setting of AXC 50 can be performed via the start guide or directly in the menu system.

Start guide

The start guide appears upon first start-up after heat pump/indoor module installation, but is also found in menu 5.7.

Menu system

If you do not make all settings via the start guide or need to change any of the settings, this can be done in the menu system.

Menu 5.2.4 - accessories

Activating/deactivating of accessories.

Select: "climate system 2", "climate system 3" and/or "climate system 4" depending on how many climate systems are installed.

Menu 5.1.2 - max flow line temperature

Setting the maximum flow temperature for each climate system.

Menu 5.3.3 - extra climate system

Mixing valve settings for extra installed climate system.

Menu 1.1 - temperature

Setting the indoor temperature.

Menu 1.9.1 - heating curve

Setting the heat curve.

Menu 1.9.2 - external adjustment

Setting external adjustment.

Menu 1.9.3 - min. flow line temp.

Setting the minimum flow temperature for each climate system.

Menu 1.9.4 - room sensor settings

Activating and setting the room temperature sensor.

Menu 5.6 - forced control

Forced control of the different components in the heat pump as well as in the different accessories that may be connected. 2 is climate system, EP22, 3 is climate system EP23, 4 is climate system EP21.

EP2#-AA5-K1: No function.

EP2#-AA5-K2: Signal (close) to mixing valve (QN25).

EP2#-AA5-K3: Signal (open) to mixing valve (QN25).

EP2#-AA5-K4: Activating the circulation pump (GP20).



Caution

Also see the Installer manual for relevant heat pump/indoor module.

[illegible]

6 Hot water comfort

General

This function allows temporary lux, mixing valve and hot water circulation.

Temporary lux (extra hot water)

If an immersion heater is installed in the tank it can be permitted to produce hot water, at the same time as the heat pump prioritises heating.

Mixing valve

A temperature sensor reads the temperature of the outgoing hot water to the domestic hot water and adjusts the mixing valve from the water heater until the set temperature has been reached.

Hot water circulation (VVC)

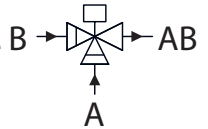
One pump can be controlled for the circulation of the hot water during selectable periods.

Pipe connections

Mixing valve

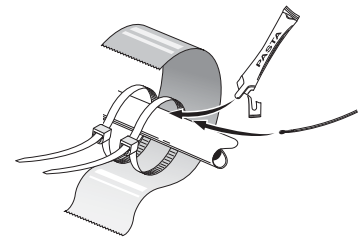
The mixing valve (FQ1) is located on the outgoing hot water line from the water heater according to the outline diagram.

- Connect the incoming cold water via the T-pipe to the port B on the mixing valve (closes at signal).
- Connect the mixed water to the domestic hot water taps from the mixing valve to the common port AB (always open).
- Connect the outgoing hot water from the water heater to the mixing valve to port A (opens on signal)



Temperature sensor

- Temperature sensor, outgoing hot water, (BT70) installed in a suitable place after the mixing valve (FQ1).



Install the temperature sensors with cable ties with the heat conducting paste and aluminium tape. Then insulate with supplied insulation tape.



NOTE

Sensor and communication cables must not be placed near power cables.

Outline diagram

Explanation

EB1 External additional heat

- AA5 Accessory card (AXC 50)
- CM5 Expansion vessel, closed
- EB1 External electrical additional heat
- FL10 Safety valve, heating medium side
- QM42 - Shut-off valve, heating medium side
- QM43
- RN11 Trim valve

EB100 Heat pump system (Master)

- BT1 Temperature sensor, outdoor
- BT6 Temperature sensor, hot water
- BT25 Temperature sensor, external flow line
- BT71 Temperature sensor, external return line
- EB100 Heat pump, F1345
- EP14 Cooling module A
- EP15 Cooling module B
- FL10 - Safety valve, collector side
- FL11
- FL12 - Safety valve, heating medium side
- FL13
- HQ12 - Particle filter
- HQ15
- QM50 - Shut-off valve, brine side
- QM53
- QM54 - Shut-off valve, heating medium side
- QM57
- QN10 Reversing valve, heating/hot water
- RM10 - Non-return valve
- RM13

QZ1 Hot water comfort

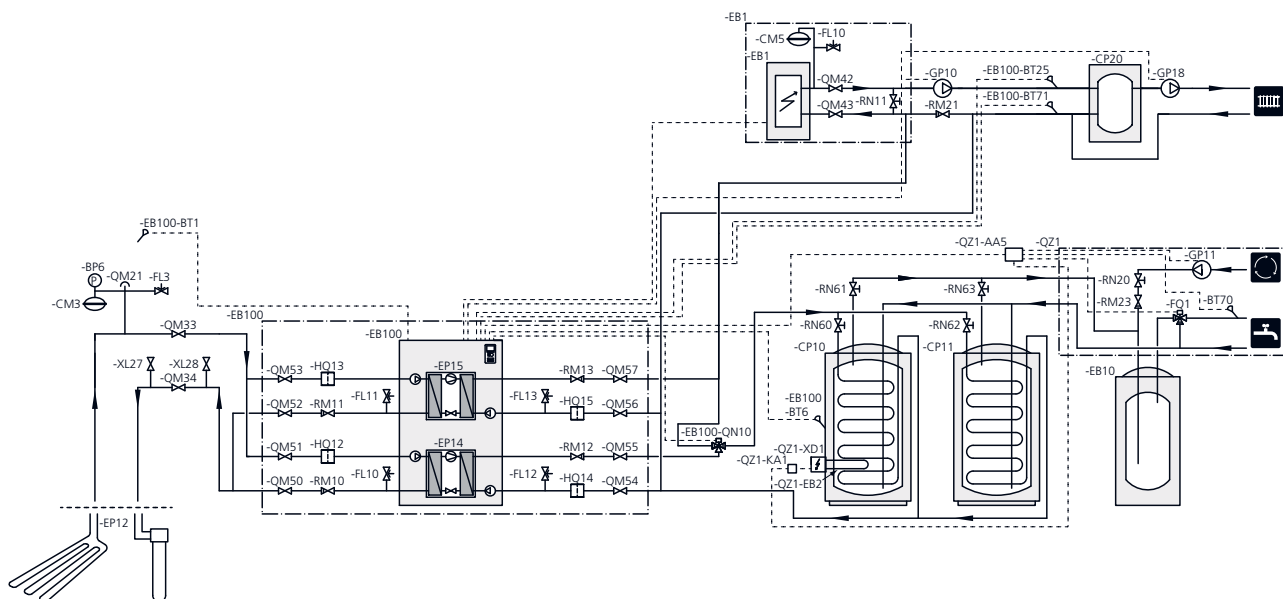
- AA5 Accessory card (AXC 50)
- BT70 Temperature sensor, outgoing hot water
- EB2 Immersion heater
- EB10 Hot water heater
- FQ1 Mixer valve, hot water
- GP11 Circulation pump, domestic hot water circulation
- KA1 Auxiliary relay, immersion heater
- RM23 Non-return valve
- RN20 Trim valve
- XD1 Connection box

Miscellaneous

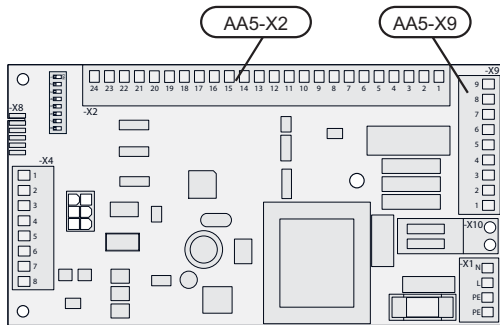
- BP6 Manometer, brine side
- CM3 Expansion vessel, brine side
- CP10, Accumulator tank with solar coil
- CP11
- CP20 Buffer vessel, UKV
- FL3 Safety valve, brine
- GP10 Circulation pump, heating medium external
- GP18 Circulation pump, heating medium external
- QM21 Venting valve, brine side
- QM33 Shut off valve, brine return
- QM34 Shut off valve, brine flow
- RM21 Non-return valve
- RN60 - Trim valves
- RN63
- XL27 - Connection, filling brine
- XL28

Designations according to standards 81346-1 and 81346-2.

Outline diagram F1345 with AXC 50 and hot water comfort



Electrical connection



NOTE

All electrical connections must be carried out by an authorised electrician.

Electrical installation and wiring must be carried out in accordance with the stipulations in force.

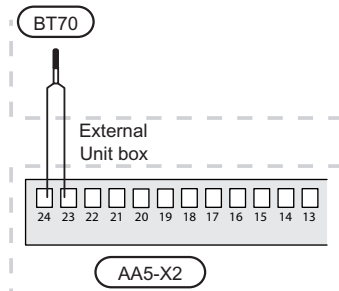
F1345 must not be powered when installing AXC 50.

Connecting sensors

Use cable type LiYY, EKKX or similar.

How water sensor, flow line (BT70)

Connect hot water sensor to AA5-X2:23-24.

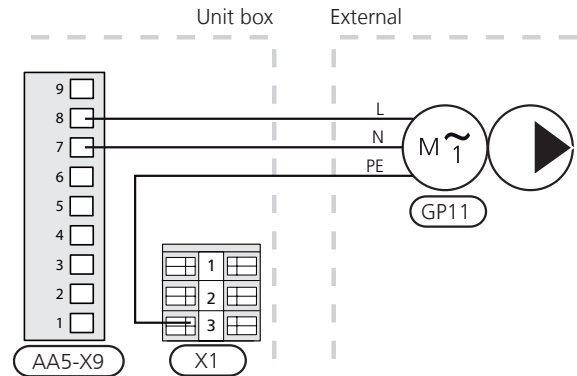


Caution

The relay outputs on the accessory card can have a max load of 2 A (230 V) in total.

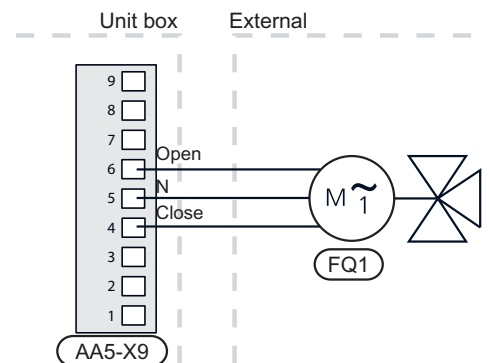
Connection of the hot water circulation pump (GP11)

Connect the circulation pump (GP11) to AA5-X9:8 (230 V), AA5-X9:7 (N) and X1:3 (PE).



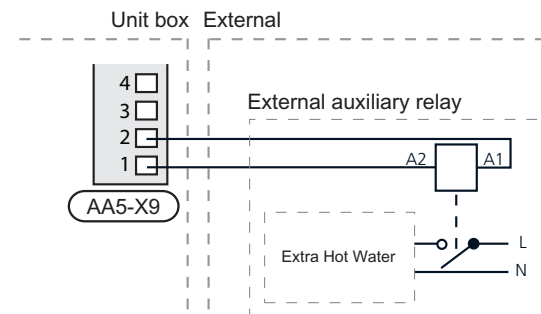
Connection of the mixing valve (FQ1)

Connect the mixing valve motor (FQ1) to AA5-X9:6 (230 V, open), AA5-X9:5 (N) and AA5-X9:4 (230 V, close).



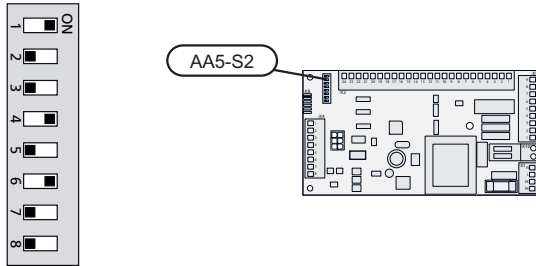
Connecting auxiliary relay for temporary lux (extra hot water)

Connect the auxiliary relay for switching the addition on and off to AA5-X9:1 (N) and AA5-X9:2 (230 V).



DIP switch

The DIP switch on the accessory card must be set as follows.



Program settings

Program setting of AXC 50 can be performed via the start guide or directly in the menu system.

Start guide

The start guide appears upon first start-up after heat pump installation, but is also found in menu 5.7.

Menu system

If you do not make all settings via the start guide or need to change any of the settings, this can be done in the menu system.

Menu 5.2.4 - accessories

Activating/deactivating of accessories.

Select: "hot water comfort".

Menu 2.9.2 - hot water recirc.

Here you can make the following settings for hot water circulation for up to three periods per day:

- How long the hot water circulation pump must run per operating instance
- How long the hot water circulation pump must be stationary between operating instances.

Menu 5.3.8 - hot water comfort

Here you can perform the following settings:

- If an immersion heater is installed in the tank and whether it can be permitted to charge hot water if the compressors in the heat pump prioritise heating.
- Whether a mixing valve for limiting the temperature of hot water from the water heater is installed.
- Various shunt settings and outgoing hot water temperature from the tank for the mixing valve.

Menu 5.6 - forced control

Forced control of the different components in the heat pump as well as in the different accessories that may be connected.

QZ1-AA5-K1: Activating the relay for extra hot water.

QZ1-AA5-K2: Signal (close) to the mixing valve (FQ1).

QZ1-AA5-K3: Signal (open) to the mixing valve (FQ1).

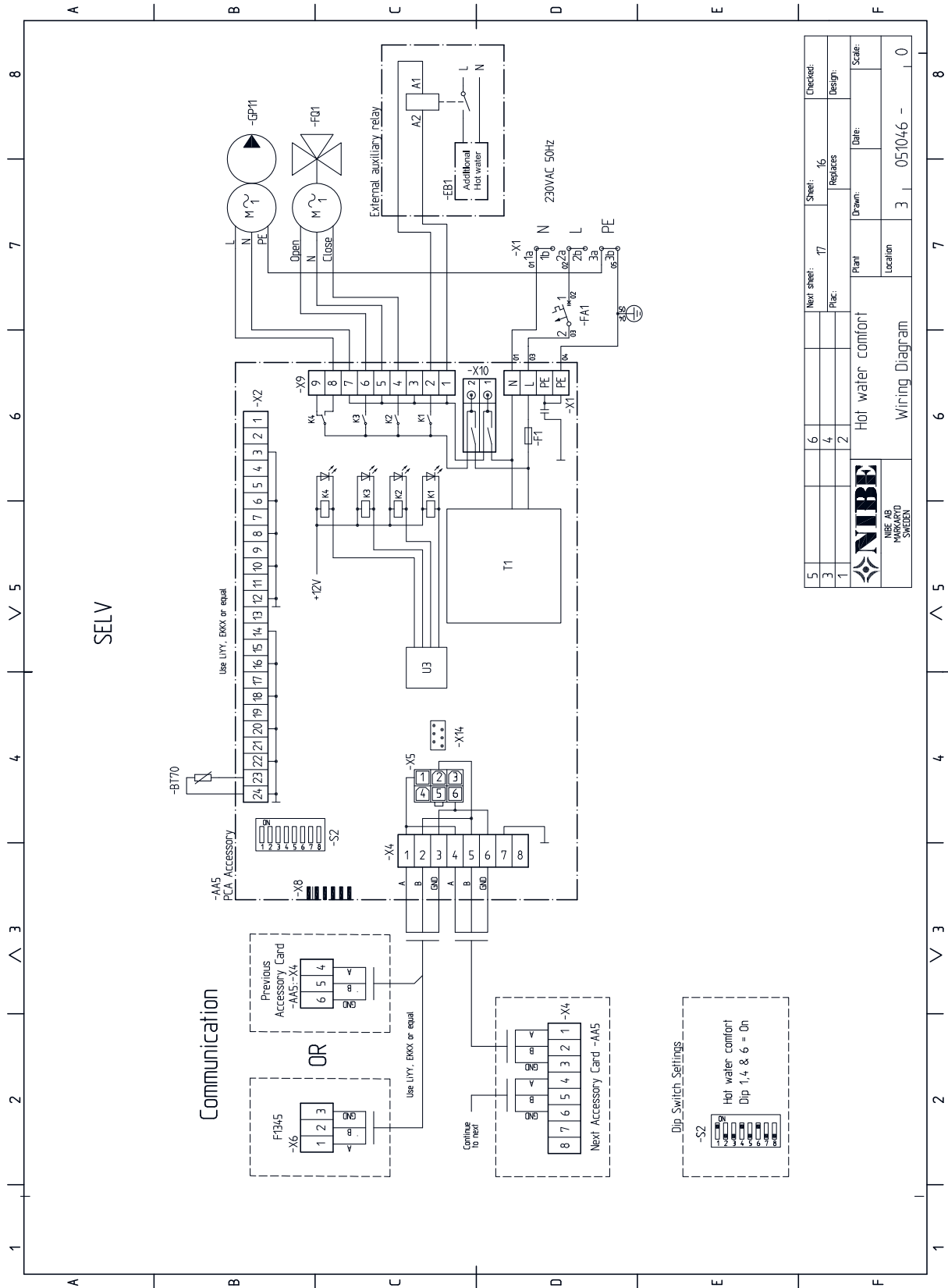
QZ1-AA5-K4: Activating the circulation pump (GP11).



Caution

Also see the Operating manual for F1345.

Electrical circuit diagram



7 Groundwater pump

General

With AXC 50 a ground water pump can be connected to the heat pump if the software controlled output (AUX output) is used for something else.

This connection enables the use of ground water as heat source. The ground water is pumped up to an intermediate heat exchanger. An intermediate heat exchanger is used to protect the heat pump's exchanger from dirt and freezing. The water is released into a buried filtration unit or a drilled well.

The ground water pump runs at the same time as the brine pump.

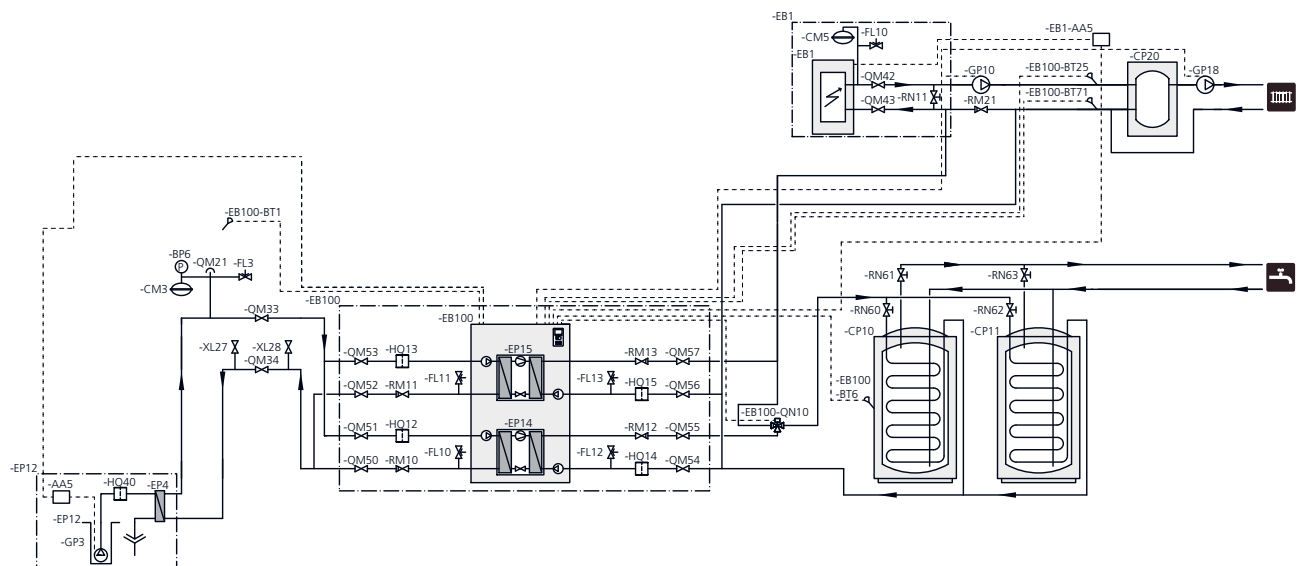
Outline diagram

Explanation

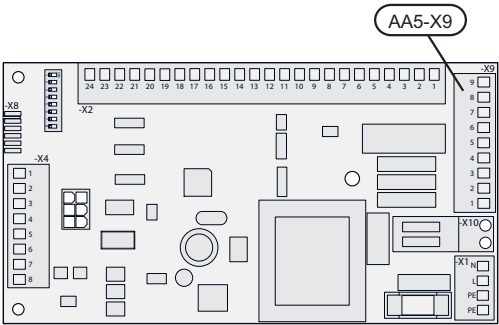
EB1	External additional heat
AA5	Accessory card (AXC 50)
CM5	Expansion vessel, closed
EB1	External electrical additional heat
FL10	Safety valve, heating medium side
QM42 - QM43	Shut-off valve, heating medium side
RN11	Trim valve
EB100	Heat pump system (Master)
BT1	Temperature sensor, outdoor
BT6	Temperature sensor, hot water charging
BT25	Temperature sensor, heating medium flow, External
BT71	Temperature sensor, heating medium return, External
EB100	Heat pump, F1345
EP14	Cooling module A
EP15	Cooling module B
FL11 - FL12	Safety valve, collector side
FL13 - FL14	Safety valve, heating medium side
HQ12 - HQ15	Particle filter
QM50 - QM53	Shut-off valve, brine side
QM54 - QM57	Shut-off valve, heating medium side
QN10	Reversing valve, heating/hot water
RM10 - RM13	Non-return valve
EP12	Collector, brine side, ground water
AA5	Accessory card (AXC 50)
EP4	Heat exchanger, groundwater
GP3	Circulation pump, groundwater
HQ40	Particle filter
Miscellaneous	
BP6	Manometer, brine side
CP10, CP11	Accumulator tank with hot water coil
CP20	Buffer vessel, UKV
CM3	Expansion vessel, closed, brine side
FL3	Safety valve, brine
GP10	Circulation pump, heating medium external
GP18	Circulation pump, heating medium external
QM21	Venting valve, brine side
QM33	Shut off valve, brine flow
QM34	Shut off valve, brine return
RM21	Non-return valve
RN60 - RN63	Trim valve
XL27 - XL28	Connection, filling brine

Designations in component locations according to standard IEC 81346-1 and 81346-2.

Outline diagram F1345 with AXC 50 and ground water pump



Electrical connection



NOTE

All electrical connections must be carried out by an authorised electrician.

Electrical installation and wiring must be carried out in accordance with the stipulations in force.

F1345 must not be powered when installing AXC 50.

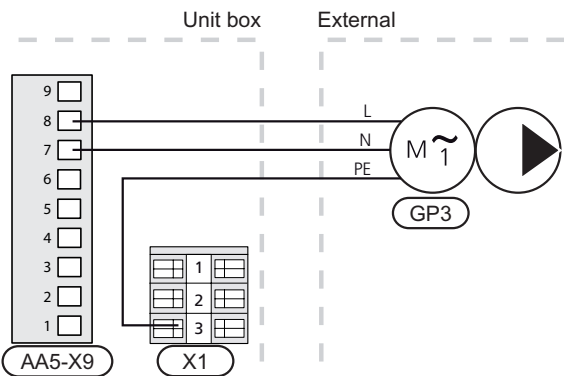
Caution

The relay outputs on the accessory card can have a max load of 2 A (230 V) in total.

The auxiliary relay (HR10) requires a greater load than 2 A (230 V).

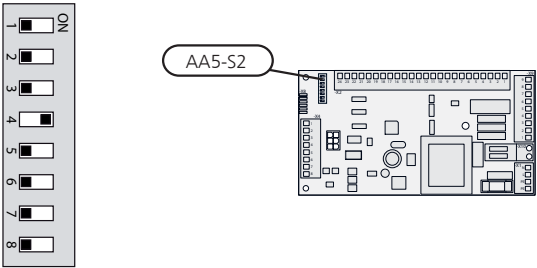
Connecting ground water pump (GP3)

Connect ground water pump (GP3) to AA5-X9:8 (230 V), AA5-X9:7 (N) and X1:3 (PE).



DIP switch

The DIP switch on the accessory card must be set as follows.



Program settings

Program setting of AXC 50 can be performed via the start guide or directly in the menu system.

Start guide

The start guide appears upon first start-up after heat pump installation, but is also found in menu 5.7.

Menu system

If you do not make all settings via the start guide or need to change any of the settings, this can be done in the menu system.

Menu 5.2.4 - accessories

Activating/deactivating of accessories.

Select: "ground water pump".

Menu 5.6 - forced control

Forced control of the different components in the heat pump as well as in the different accessories that may be connected.

EP12-AA5-K1: No function.

EP12-AA5-K2: No function.

EP12-AA5-K3: No function.

EP12-AA5-K4: Activating the circulation pump (GP3).

Caution

Also see the Operating manual for F1345.

[illegible]

8 Passive cooling (4-pipe)

General

The cooling system is connected to the heat pump collect- or circuit, through which cooling is supplied from the collector via the circulation pump and the shunt valve.

When cooling is required (activated from the outdoor sensor and any room sensor) the circulation pump is ac- tivated. The shunt valve regulates so that the cooling sensor reaches the current set point value that is equal to the outdoor temperature and the set min. value for the cooling temperature (to prevent condensation).



Caution

This accessory may require a program software update in your F1345.

2755 or higher is the minimum software version for the heat pump.

Pipe connections

General

Pipes and other cold surfaces must be insulated with dif- fusion-proof material to prevent condensation. Where the cooling demand is high, fan convectors with drip trays and drain connection are needed.

The brine circuit must be supplied with a pressure expan- sion vessel. If there is already a level vessel installed this should be replaced.

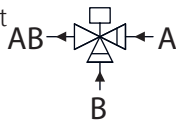
Non-return valve

Install a check valve between two T-pipe connections to passive cooling on brine out (see the outline diagram).

Shunt valve

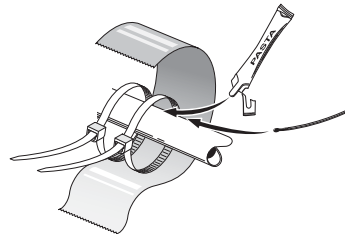
The shunt valve (QN18) is located in the brine system on the flow line from the heat pump via the T-pipe connec- tions according to the outline diagram.

- Connect the brine out from the heat pump via T-pipes to port A on the shunt valve (opens at increased sig- nal).
- Connect the flow line to the con- vector fan from the shunt valve to the common port AB (always open)
- Connect the return line from the fan convector to the shunt valve and brine out to the collector to port B via T-pipe (closes at reduced signal).



Temperature sensor

- Install the flow temperature sensor for the cooling system (BT64) on the pipe after the circulation pump (GP13) in the direction of flow.
- Install the return line sensor for the cooling system (BT65) on the pipe from the cooling system.



Install the temperature sensors with cable ties with the heat conducting paste and aluminium tape. Then insulate with supplied insulation tape.



NOTE

Sensor and communication cables must not be placed near power cables.

Outline diagram

Explanation

EB1	External additional heat
AA5	Accessory card (AXC 50)
CM5	Expansion vessel, closed
EB1	External electrical additional heat
FL10	Safety valve, heating medium side
QM42 - QM43	Shut-off valve, heating medium side
RN11	Trim valve
EB100	Heat pump system (Master)
BT1	Temperature sensor, outdoor
BT6	Temperature sensor, hot water charging
BT25	Temperature sensor, heating medium flow, External
BT71	Temperature sensor, heating medium return, External
EB100	Heat pump, F1345
EP14	Cooling module A
EP15	Cooling module B
FL11 - FL12	Safety valve, collector side
FL13 - FL14	Safety valve, heating medium side
HQ12 - HQ15	Particle filter
QM50 - QM53	Shut-off valve, brine side
QM54 - QM57	Shut-off valve, heating medium side
QN10	Reversing valve, heating/hot water
RM10 - RM13	Non-return valve

EQ1

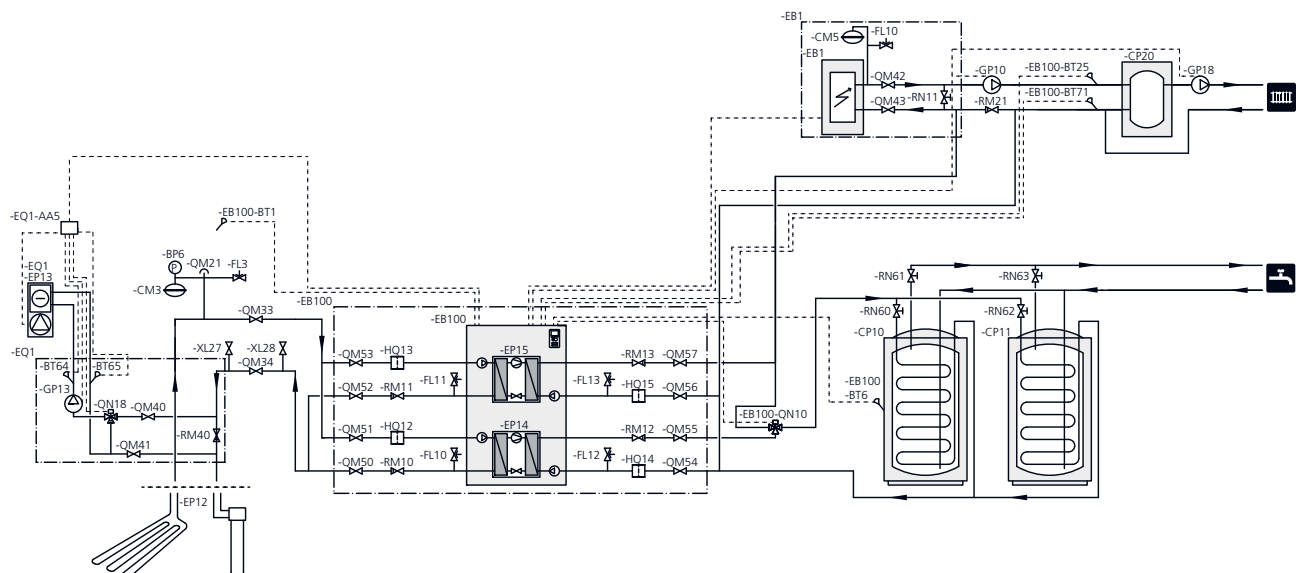
AA5	Accessory card (AXC 50)
BT64	Temperature sensor, cooling flow line
BT65	Temperature sensor, cooling return line
EP13	Fan convectors
GP13	Circulation pump, cooling
QM40 - QM41	Shut-off valve
QN18	Mixing valve, cooling
RM40	Non-return valve

Miscellaneous

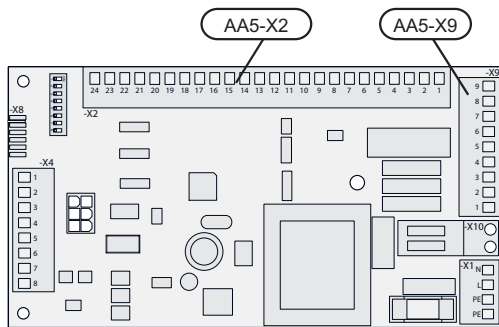
BP6	Manometer, brine side
CP10, CP11	Accumulator tank with hot water coil
CP20	Buffer vessel (UKV)
CM3	Expansion vessel, closed, brine side
EP12	Collector, brine side
FL3	Safety valve, brine
GP10	Circulation pump, heating medium external
GP18	Circulation pump, heating medium external
QM21	Venting valve, brine side
QM33	Shut off valve, brine flow
QM34	Shut off valve, brine return
RN60 - RN63	Trim valve
XL27 - XL28	Connection, filling brine

Designations according to standards 81346-1 and 81346-2.

Outline diagram F1345 with AXC 50 and passive cooling (4 pipe)



Electrical connection



NOTE

All electrical connections must be carried out by an authorised electrician.

Electrical installation and wiring must be carried out in accordance with the stipulations in force.

F1345 must not be powered when installing AXC 50.

Connection of sensors and external blocking

Use cable type LiYY, EKKX or similar.

Flow temperature sensor, cooling (BT64)

Connect the flow temperature sensor to AA5-X2:21-22.

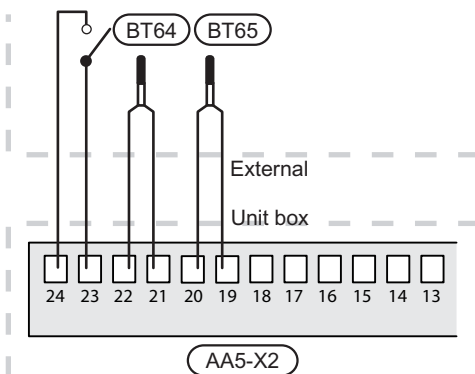
Return line sensor, cooling (BT65)

Connect the return line sensor to AA5-X2:19-20.

External blocking

A contact (NO) can be connected to AA5-X2:23-24 to block cooling operation. When the contact closes, cooling operation is blocked.

External blocking

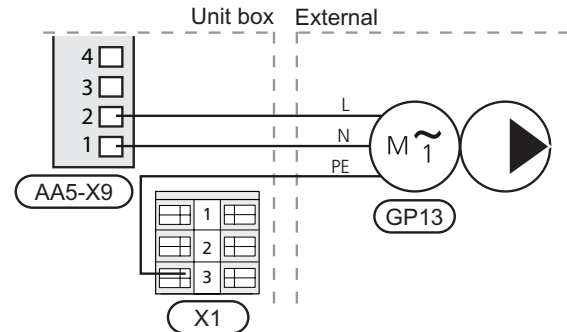


Caution

The relay outputs on the accessory card can have a max load of 2 A (230 V) in total.

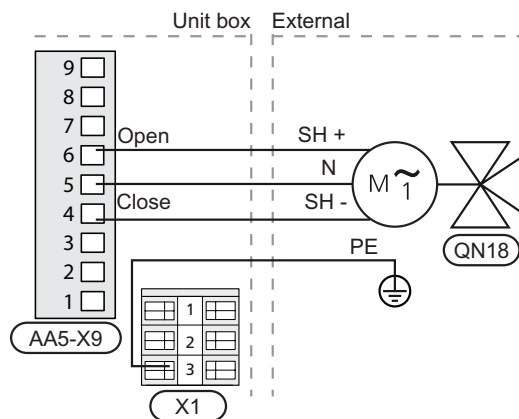
Connection of the circulation pump (GP13)

Connect the circulation pump (GP13) to AA5-X9:2 (230 V), AA5-X9:1 (N) and X1:3 (PE).



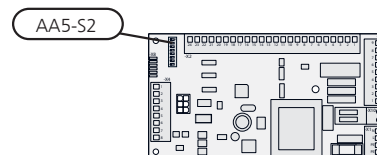
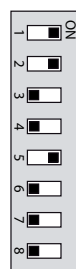
Connection of the mixing valve motor (QN18)

Connect the mixing valve motor (QN18) to AA5-X9:6 (230 V, open), AA5-X9:5 (N) and AA5-X9:4 (230 V, close).



DIP switch

The DIP switch on the accessory card must be set as follows.



Relay output for cooling mode indication

It is possible to have an external indication of cooling mode through the relay function via a potential free variable relay (max 2 A) on terminal block X5.

If cooling mode indication is connected to terminal block X5 it must be selected in menu 5.4.

Program settings

Program setting of AXC 50 can be performed via the start guide or directly in the menu system.

Start guide

The start guide appears upon first start-up after heat pump installation, but is also found in menu 5.7.

Menu system

If you do not make all settings via the start guide or need to change any of the settings, this can be done in the menu system.

Menu 5.2.4 - accessories

Activating/deactivating of accessories.

Select: "passive cooling 4-pipe".

Menu 1.1 - temperature

Setting indoor temperature (room temperature sensor is required).

Menu 1.9.5 - cooling settings

Here you can perform the following settings:

- Lowest flow line temperature when cooling.
- Desired flow temperature at an outdoor air temperature of +20 and +40 °C.
- Time between cooling and heating or vice versa.
- Selection of room sensor can control cooling.
- How much the room temperature may decrease or increase compared to the desired temperature before switching to heating respectively cooling (requires room sensor).
- Misc. shunt settings.

Menu 4.9.2 - auto mode setting

When heat pump operating mode is set to "auto" it selects when start and stop of additional heat, heat production and cooling is permitted, dependent on the average outdoor temperature.

Select the average outdoor temperatures in this menu.

You can also set the time over which (filtering time) the average temperature is calculated. If you select 0, the present outdoor temperature is used.

Menu 5.6 - forced control

Forced control of the different components in the heat pump as well as in the different accessories that may be connected.

EQ1-AA5-K1: Activating the circulation pump (GP13).

EQ1-AA5-K2: Signal (close) to mixing valve (QN18).

EQ1-AA5-K3: Signal (open) to mixing valve (QN18).

EQ1-AA5-K4: No function.



Caution

Also see the Operating manual for F1345.

[illegible]

9 Passive cooling (2-pipe)

General

The collector circuit is connected to a heat exchanger via a three way valve. The other side of the exchanger is connected to the heating medium circuit via a shunt valve and a circulation pump.

When cooling is required (activated from the outdoor sensor and any room sensor or room unit) the three way valve and the circulation pump are activated. The shunt valve regulates so that the cooling sensor reaches the current set point value that is equal to the outdoor temperature and the set min. value for the cooling temperature (to prevent condensation).

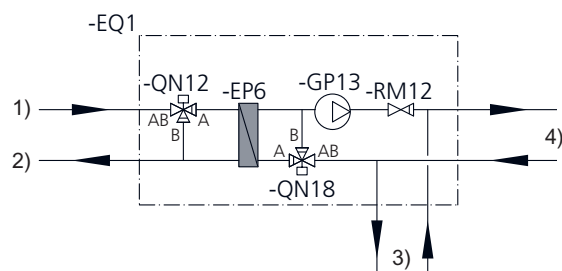


Caution

This accessory may require a program software update in your F1345.

2755 or higher is the minimum software version for the heat pump.

Pipe connections

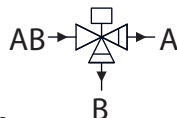


- 1) Brine from heat pump
- 2) Brine to brine system
- 3) Heating medium to and from the heat pump
- 4) Heating medium to and from the climate system

Shuttle valve

The three way valve (QN12) is located in the brine system on the flow line from the heat pump according to the outline diagram.

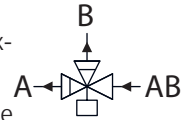
- Connect port A on the three-way valve (open at signal) to the exchanger (EP6).
- Connect the common port AB on the three-way valve (always open) to the flow line (brine) from the heat pump.
- Connect port B on the three-way valve (normally open, motor in stand-by mode) via T-pipe to brine out to the collector from the exchanger (EP6).



Shunt valve

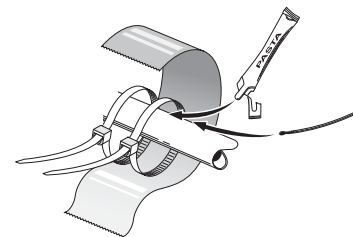
The shunt valve (QN18) is located on the return to the heat pump from the climate system according to the outline diagram.

- Connect port A on the shunt valve (opens at increased signal) to the exchanger (EP6).
- Connect the common port AB on the shunt valve (always open) to the return line from the climate system.
- Connect port B on the shunt valve (closes at reduced signal) via T-pipe to the flow line to the climate system from the exchanger.



Temperature sensor

- External flow temperature sensor (BT25, connected in F1345) must be installed on the flow line to the radiators, after the shunt valve ((QN18)).



Install the temperature sensors with cable ties with the heat conducting paste and aluminium tape. Then insulate with supplied insulation tape.



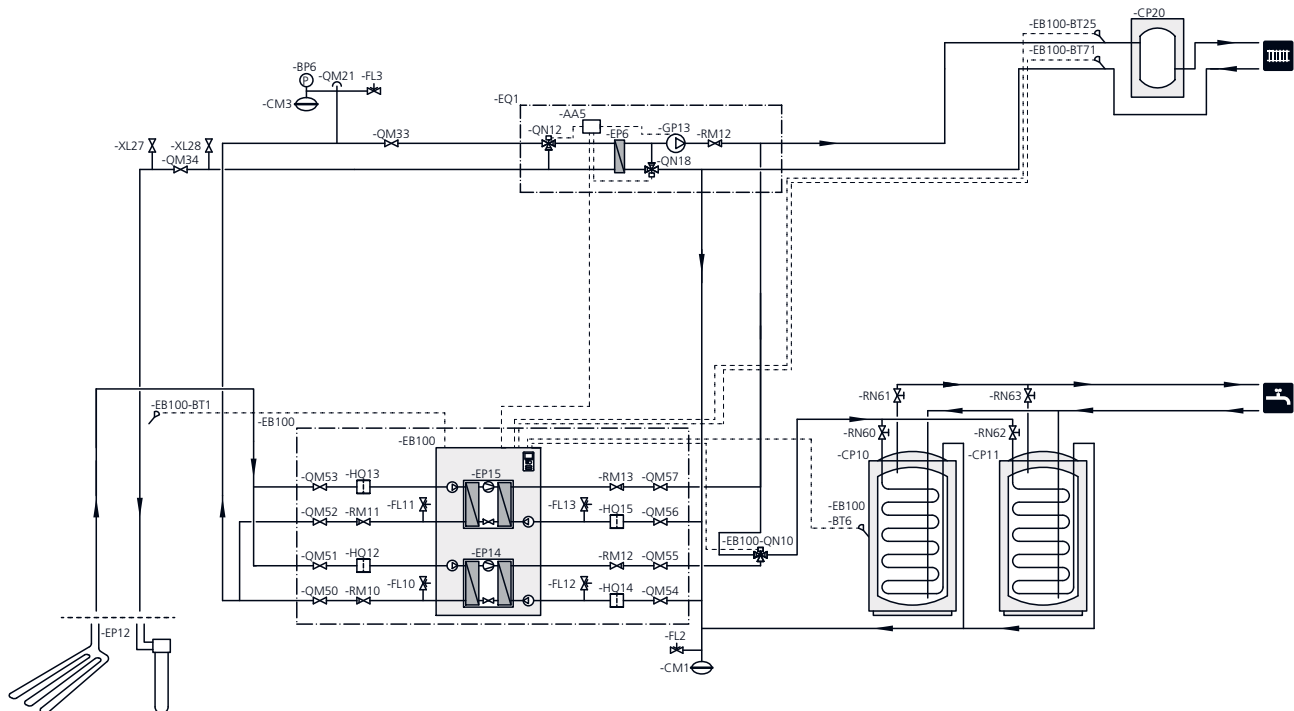
NOTE

Sensor and communication cables must not be placed near power cables.

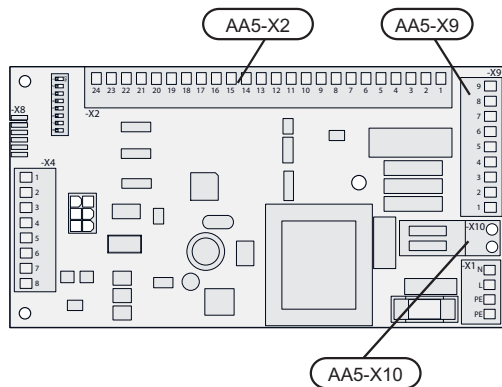
Explanation

RM10 - RM13	Non-return valve
EQ1	Passive cooling 2-pipe
AA5	Accessory card (AXC 50)
EP6	Heat exchanger, cooling
QN12	Reversing valve, cooling/heating
QN18	Mixing valve, cooling
RM12	Non-return valve
Miscellaneous	
BP6	Manometer, brine side
CP10, CP11	Accumulator tank with hot water coil
CP20	Buffer vessel (UKV)
CM1	Expansion vessel, closed, heating medium side
CM3	Expansion vessel, closed, brine side
EP12	Collector, brine side
FL2	Safety valve, heating medium side
FL3	Safety valve, brine
GP10	Circulation pump, heating medium external
QM21	Venting valve, brine side
QM33	Shut off valve, brine flow
QM34	Shut off valve, brine return
RN60 - RN63	Trim valve
XL27 - XL28	Connection, filling brine

Outline diagram F1345 with AXC 50 and passive cooling (2 pipe)



Electrical connection



NOTE

All electrical connections must be carried out by an authorised electrician.

Electrical installation and wiring must be carried out in accordance with the stipulations in force.

F1345 must not be powered when installing AXC 50.

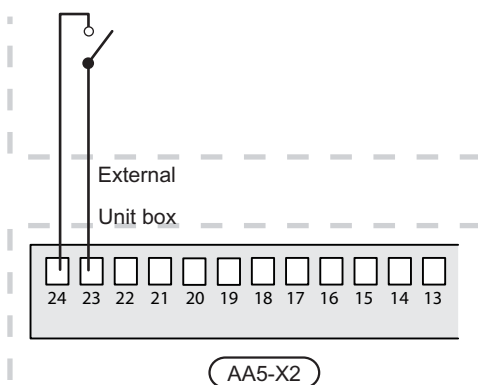
Connection of sensors and external blocking

Use cable type LiYY, EKKX or similar.

External blocking

A contact (NO) can be connected to AA5-X2:23-24 to block cooling operation. When the contact closes, cooling operation is blocked.

External blocking

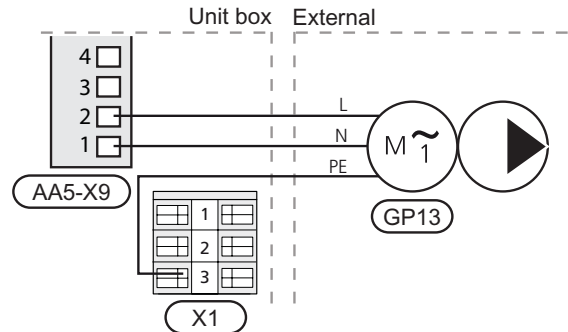


Caution

The relay outputs on the accessory card can have a max load of 2 A (230 V) in total.

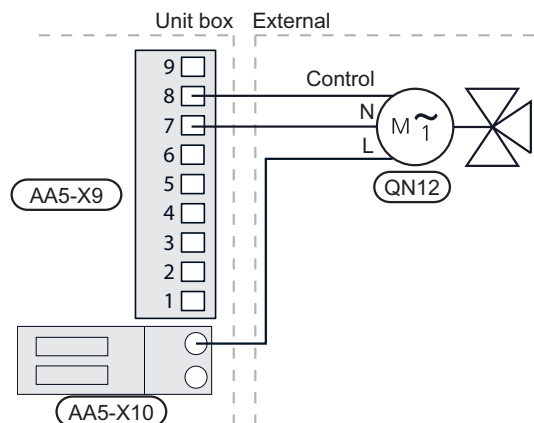
Connection of the circulation pump (GP13)

Connect the circulation pump (GP13) to AA5-X9:2 (230 V), AA5-X9:1 (N) and X1:3 (PE).



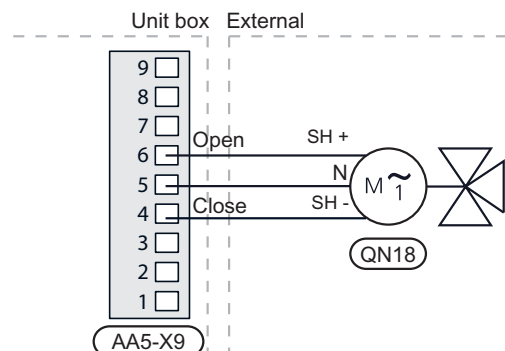
Connection of three-way valve motor (QN12)

Connect the three-way valve motor (QN12) to AA5-X9:8 (operating), AA5-X9:7 (N) and AA5-X10:2 (L).



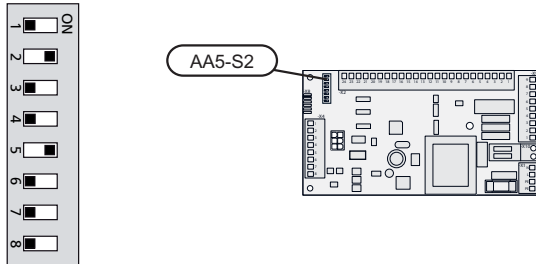
Connection of the mixing valve motor (QN18)

Connect the mixing valve motor (QN18) to AA5-X9:6 (230 V, open), AA5-X9:5 (N) and AA5-X9:4 (230 V, close).



DIP switch

The DIP switch on the accessory card must be set as follows.



Relay output for cooling mode indication

It is possible to have an external indication of cooling mode through the relay function via a potential free variable relay (max 2 A) on terminal block X5.

If cooling mode indication is connected to terminal block X5 it must be selected in menu 5.4.

Program settings

Program setting of AXC 50 can be performed via the start guide or directly in the menu system.

Start guide

The start guide appears upon first start-up after heat pump installation, but is also found in menu 5.7.

Menu system

If you do not make all settings via the start guide or need to change any of the settings, this can be done in the menu system.

Menu 5.2.4 - accessories

Activating/deactivating of accessories.

Select: "passive cooling 2-pipe".

Menu 1.1 - temperature

Setting indoor temperature (room temperature sensor is required).

Menu 1.9.5 - cooling settings

Here you can perform the following settings:

- Lowest flow line temperature when cooling.
- Desired flow temperature at an outdoor air temperature of +20 and +40 °C.
- Time between cooling and heating or vice versa.
- Selection of room sensor can control cooling.
- How much the room temperature may decrease or increase compared to the desired temperature before switching to heating respectively cooling (requires room sensor).
- Misc. shunt settings.

Menu 4.9.2 - auto mode setting

When heat pump operating mode is set to "auto" it selects when start and stop of additional heat, heat production and cooling is permitted, dependent on the average outdoor temperature.

Select the average outdoor temperatures in this menu.

You can also set the time over which (filtering time) the average temperature is calculated. If you select 0, the present outdoor temperature is used.

Menu 5.6 - forced control

Forced control of the different components in the heat pump as well as in the different accessories that may be connected.

EQ1-AA5-K1: Activating the circulation pump (GP13).

EQ1-AA5-K2: Signal (close) to mixing valve (QN18).

EQ1-AA5-K3: Signal (open) to mixing valve (QN18).

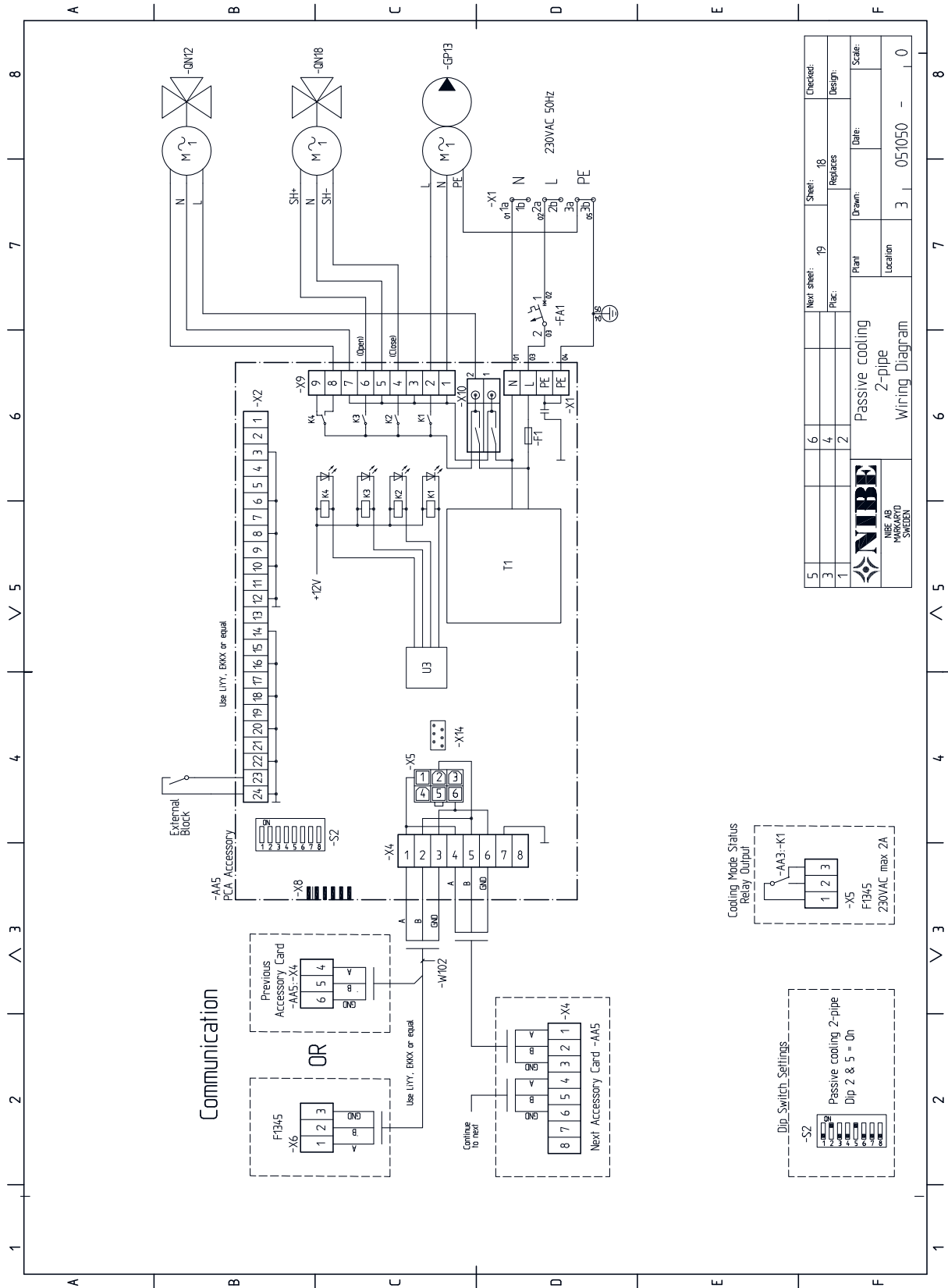
EQ1-AA5-K4: Signal to three way valve (QN12).



Caution

Also see the Operating manual for F1345.

Electrical circuit diagram



10 Passive/active cooling (2-pipe)

General

The heating/cooling modes are controlled by 4 three-way valves, which, depending on the outdoor temperature and/or room temperature, switch between the different modes.

The cooling supply to the building is controlled by the set curve in the control system. After adjustment the correct amount of cooling for the current outdoor temperature is supplied. The flow temperature from the three-way valves will hover around the theoretical required value (settable in the control system). In the event of excess temperature F1345 calculates a surplus in the form of degrees-minutes, which means that the greater the excess temperature that temporarily prevails the more the connection of cooling production is accelerated.

F1345 automatically switches to cooling mode when the outdoor temperature exceeds the set value.

Passive cooling means that F1345 with the aid of the circulation pumps, circulates fluid from the ground/rock collector through the building's distribution system and cools the building.

When the cooling requirement is large and passive cooling is not sufficient, active cooling is engaged at the preset limit value. A compressor then starts and the resulting cold medium circulates to the building's climate system and the heat circulates out to the ground/rock collector. If several compressors are available these will start with a difference of the set degree minutes.



NOTE

This system solution means that the brine will also circulate through the heating system. Check that all component parts are designed for the brine in question.

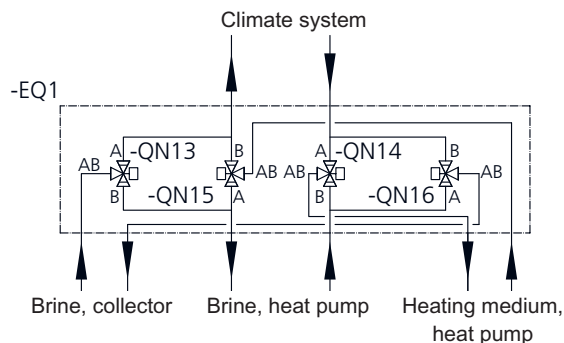


Caution

This accessory may require a program software update in your F1345. 2755 or higher is the minimum software version for the heat pump.

Pipe connections

Reversing valves



Install the three-way valves according to the outline diagram above.

A: Open at signal.

B: Normally open (motor in standby mode).

AB: Always open.

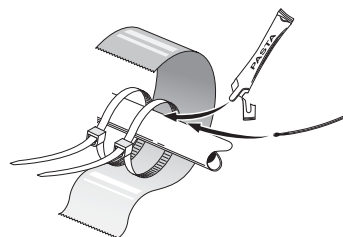
Condensation insulation

Pipes and other cold surfaces must be insulated with diffusion-proof material to prevent condensation.

Where the system may be operated at low temperatures, any convection fan used must be fitted with a drip tray and drain connection.

Temperature sensor

- External flow temperature sensor (BT25, connected in F1345) must be installed on the flow line to the climate system, after the three way valves (QN13) - (QN16).



Install the temperature sensors with cable ties with the heat conducting paste and aluminium tape. Then insulate with supplied insulation tape.



NOTE

Sensor and communication cables must not be placed near power cables.

Outline diagram

Explanation

EB100 Heat pump system (Master)

BT1	Temperature sensor, outdoor
BT6	Temperature sensor, hot water charging
BT25	Temperature sensor, heating medium flow, External
BT71	Temperature sensor, heating medium return, External
EB100	Heat pump, F1345
EP14	Cooling module A
EP15	Cooling module B
FL11 - FL12	Safety valve, collector side
FL13 - FL14	Safety valve, heating medium side
HQ12 - HQ15	Particle filter
QM50 - QM53	Shut-off valve, brine side
QM54 - QM57	Shut-off valve, heating medium side
QN10	Reversing valve, heating/hot water
RM10 - RM13	Non-return valve

EQ1 Passive/active cooling 2-pipe

AA5 Accessory card (AXC 50)

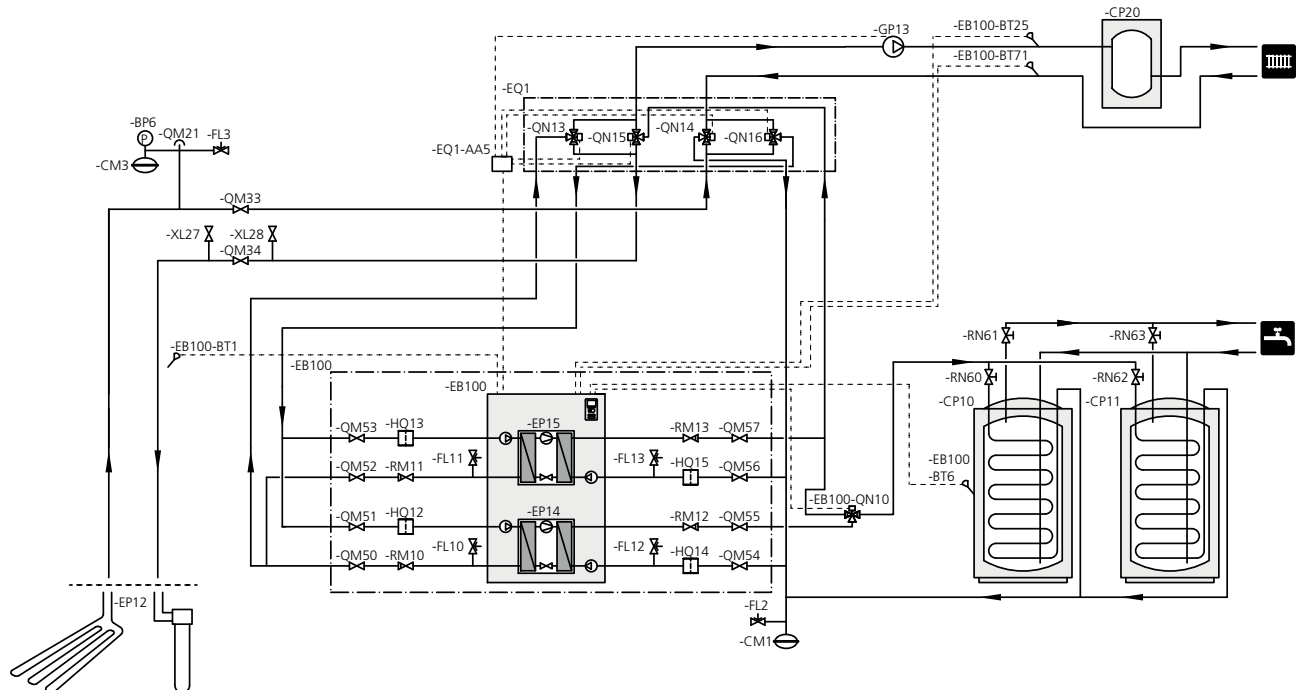
QN13 - QN16 Reversing valve, cooling/heating

Miscellaneous

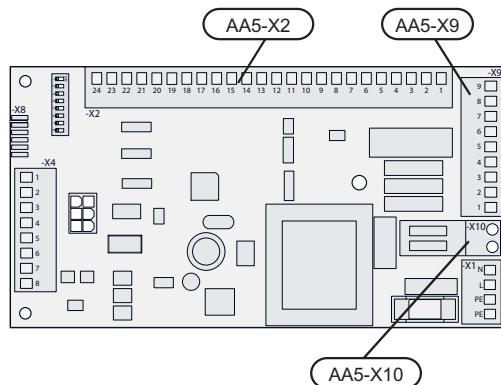
BP6	Manometer, brine side
CP10, CP11	Accumulator tank with hot water coil
CP20	Buffer vessel (UKV)
CM1	Expansion vessel, closed, heating medium side
CM3	Expansion vessel, closed, brine side
EP12	Collector, brine side
FL2	Safety valve, heating medium side
FL3	Safety valve, brine
GP10	Circulation pump, heating medium external
QM21	Venting valve, brine side
QM33	Shut off valve, brine flow
QM34	Shut off valve, brine return
RN60 - RN63	Trim valve
XL27 - XL28	Connection, filling brine

Designations according to standards 81346-1 and 81346-2.

Outline diagram F1345 with AXC 50 and passive/active cooling (2 pipe)



Electrical connection



NOTE

All electrical connections must be carried out by an authorised electrician.

Electrical installation and wiring must be carried out in accordance with the stipulations in force.

F1345 must not be powered when installing AXC 50.

Connecting external blocking

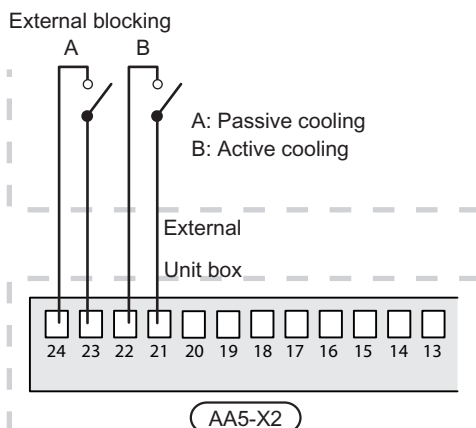
Use cable type LiYY, EKKX or similar.

External blocking, passive cooling (optional)

A contact (NO) can be connected to AA5-X2:23-24 to block passive cooling operation. When the contact closes, passive cooling is blocked.

External blocking, active cooling (optional)

A contact (NO) can be connected to AA5-X2:21-22 to block active cooling operation. When the contact closes, active cooling is blocked.



Caution

The relay outputs on the accessory card can have a max load of 2 A (230 V) in total.

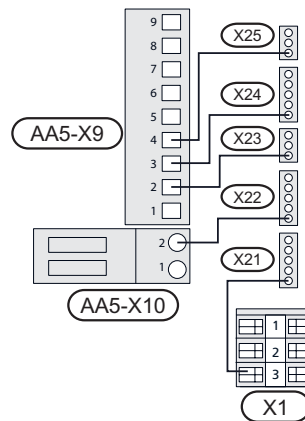
Connecting top clips



NOTE

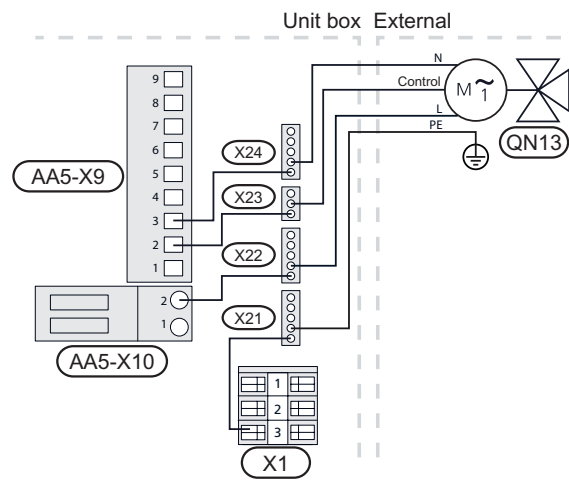
To connect the three-way valves to the accessory card, top clips are required (3x 5-pin and 2x 3-pin).

Connect top clip X21:1 to X1:3 (PE), top clip X22:1 to AA5-X10:2 (L), top clip X23:1 to AA5-X9:2 (operating), top clip X24:1 to AA5-X9:3 (N) and top clip X25:1 to AA5-X9:4 (operation).



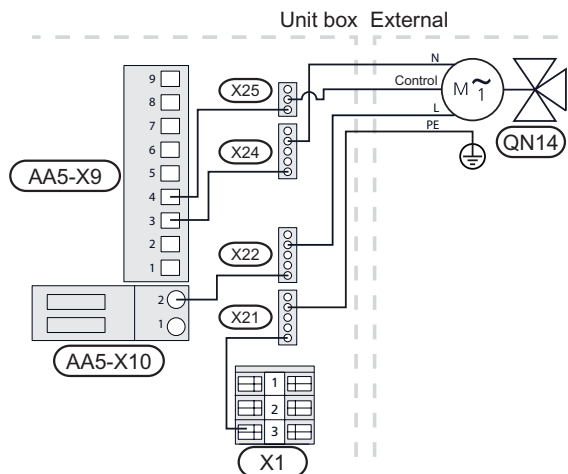
Connection of three-way valve motor (QN13)

Connect the three way valve motor (QN13) to top clip X21:2 (PE), top clip X22:2 (L), top clip X23:2 (operation) and top clip X24:2 (N).



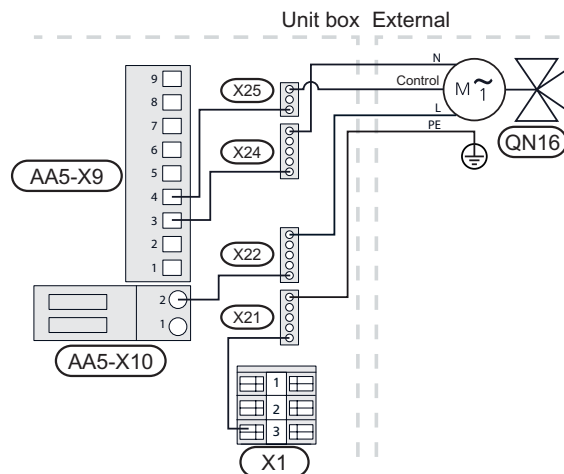
Connection of three-way valve motor (QN14)

Connect the three way valve motor (QN14) to top clip X21:4 (PE), top clip X22:4 (L), top clip X25:2 (operation) and top clip X24:4 (N).



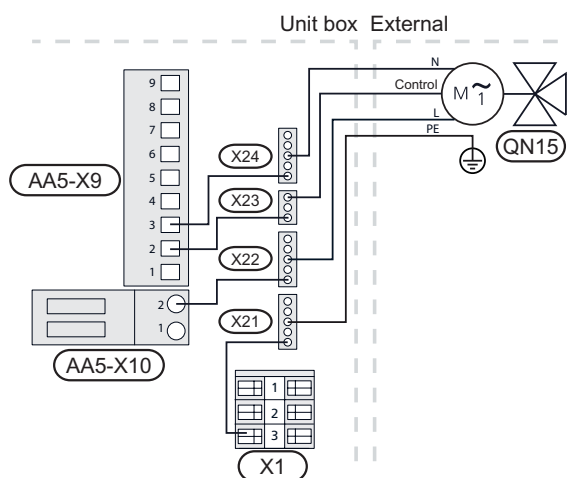
Connection of three-way valve motor (QN16)

Connect the three way valve motor (QN16) to top clip X21:5 (PE), top clip X22:5 (L), top clip X25:3 (operation) and top clip X24:5 (N).



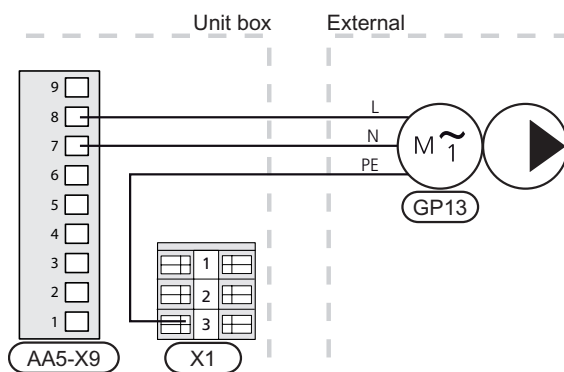
Connection of three-way valve motor (QN15)

Connect the three way valve motor (QN15) to top clip X21:3 (PE), top clip X22:3 (L), top clip X23:3 (operation) and top clip X24:3 (N).



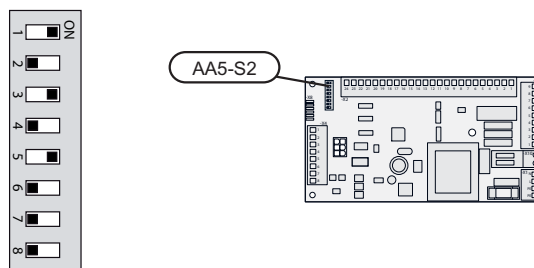
Connection of any circulation pump (GP13)

Connect the circulation pump (GP13) to AA5-X9:8 (230 V), AA5-X9:7 (N) and X1:3 (PE).



DIP switch

The DIP switch on the accessory card must be set as follows.



Relay output for cooling mode indication

It is possible to have an external indication of cooling mode through the relay function via a potential free variable relay (max 2 A) on terminal block X5.

If cooling mode indication is connected to terminal block X5 it must be selected in menu 5.4.

Program settings

Program setting of AXC 50 can be performed via the start guide or directly in the menu system.

Start guide

The start guide appears upon first start-up after heat pump installation, but is also found in menu 5.7.

Menu system

If you do not make all settings via the start guide or need to change any of the settings, this can be done in the menu system.

Menu 5.2.4 - accessories

Activating/deactivating of accessories.

Select: "passive/active cooling 2-pipe".

Menu 1.1 - temperature

Setting indoor temperature (room temperature sensor is required).

Menu 1.9.5 - cooling settings

Here you can perform the following settings:

- Lowest flow line temperature when cooling.
- Desired flow temperature at an outdoor air temperature of +20 and +40 °C.
- Time between cooling and heating or vice versa.
- Selection of room sensor can control cooling.
- How much the room temperature may decrease or increase compared to the desired temperature before switching to heating respectively cooling (requires room sensor).
- Degree minute levels for cooling.
- Misc. shunt settings.

Menu 4.9.2 - auto mode setting

When heat pump operating mode is set to "auto" it selects when start and stop of additional heat, heat production and cooling is permitted, dependent on the average outdoor temperature.

Select the average outdoor temperatures in this menu.

You can also set the time over which (filtering time) the average temperature is calculated. If you select 0, the present outdoor temperature is used.

Menu 5.6 - forced control

Forced control of the different components in the heat pump as well as in the different accessories that may be connected.

EQ1-AA5-K1: Signal to three way valves (QN13) and (QN15).

EQ1-AA5-K2: Signal to three way valves (QN14) and (QN16).

EQ1-AA5-K3: No function.

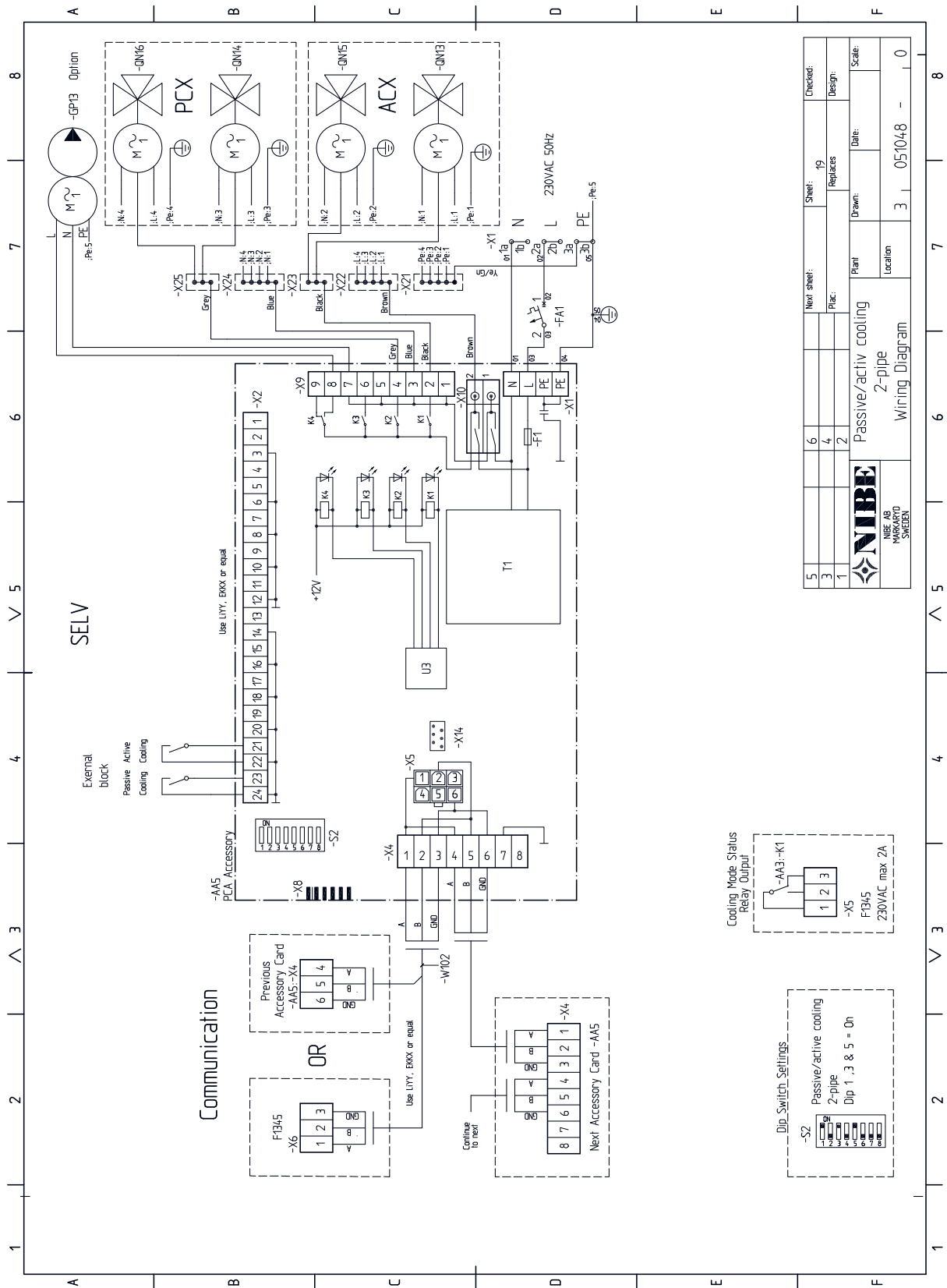
EQ1-AA5-K4: Activating the circulation pump (GP13).



Caution

Also see the Operating manual for F1345.

Electrical circuit diagram



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